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### SOME PROBLEMS OF ANÆSTHESIA IN 1947.

By GEOFFREY KAYE, M.D., D.A.,  
Melbourne.

ANÆSTHESIA, from the Australian standpoint, was born in Launceston a hundred years ago. It has grown into a promising adolescent, not yet capable of original work of the first order, but able fully to appreciate the discoveries of others and to apply them in a critical manner. The future of the speciality in Australia is brighter than ever before. It is appropriate at this centenary to raise some of the problems which face the anæsthetist of 1947 and to indicate, without dogmatism, his standpoint towards them. So rapidly, however, is anæsthesia developing that his standpoint a year hence may be very different from that of today. Further, one may still profit from Saint Paul's warning: "Let him that thinketh he standeth, take heed lest he fall."

#### Respiration.

The understanding of the respiratory function is, for the anæsthetist, the beginning of wisdom. Of the signs of anæsthesia, none is so consistent as is the respiration and none so revealing as to the patient's condition. The classical description of the respiratory signs by Guedel<sup>(1)</sup> and its later amplification by Gillespie<sup>(2)</sup> and Watson<sup>(3)</sup> should be familiar to every anæsthetist.

Three groups of muscles take part in respiration, namely, the diaphragm, the intercostals and the accessory muscles, such as the *saceni* and *pectorales*. In light anæsthesia, respiration is performed by the diaphragm and intercostal muscles, the accessory muscles taking no part if the air passages are unobstructed. In deep anæsthesia of the third plane of the third stage, intercostal activity

diminishes progressively and lags behind diaphragmatic. In the fourth plane of this stage, the intercostal muscles are paralysed and respiration is wholly diaphragmatic. It follows that deep surgical anæsthesia cannot be obtained without the production of more or less intercostal paralysis, with consequent reduction in the respiratory excursion and in the minute-volume of respiration. Upon this fact is based the modern approach to the problem of deep surgical anæsthesia.

Early in the administration, and before depression has resulted from deep anæsthesia, the anæsthetist should attempt to assess the tidal volume of the respiration, that is, the volume of air taken into and exhaled from the lungs at each quiet, unhurried, unobstructed breath. It will average, in the adult patient, four hundred cubic centimetres. The anæsthetist must familiarize himself with respiration of this depth, as shown by the respiratory movements and by the breathing bag of the anæsthesia apparatus. Should the tidal volume decline materially at any period of the administration, one of three things must be done. Firstly, anæsthesia must be lightened until an adequate respiratory excursion is restored. If this is impracticable, the anæsthetic mixture must be enriched with oxygen so that the shallow respirations may yet serve to oxygenate the blood. Should they fail to do so, manual control over the respiration must be exercised as will be described below.

A deficient intake of oxygen usually manifests itself in cyanosis of greater or less intensity. Cyanosis can develop, however, only when the arterial blood contains at least five grammes of reduced hæmoglobin per hundred millilitres. This cannot occur in anæmic subjects, who may therefore die of anoxia without presenting cyanosis. Further, in febrile or thyrotoxic subjects an intake of oxygen which is sufficient to oxygenate the hæmoglobin and maintain the normal colour of the blood may yet be insufficient for the abnormally high metabolic needs. Hence, whilst cyanosis should be regarded always as a danger signal, its absence does not guarantee safety. The anæsthetist must look to the respiratory, circulatory and

<sup>1</sup>This paper was read at Launceston, Tasmania, on June 8, 1947, at a meeting held to commemorate the centenary of the first administration of anæsthesia in Australia.

muscular signs of oxygen lack as well as to the colour of the blood.

The respiratory function is a dual one, involving the elimination of carbon dioxide as well as the intake of oxygen. In conscious life, a respiratory volume sufficient for the one purpose will suffice for the other. In anaesthesia, this is not necessarily the case. When the respiration is shallow, it is usually possible to saturate the haemoglobin and to prevent anoxia by enrichment of the anaesthetic mixture with oxygen. Without a reasonable minute-volume, however, carbon dioxide will not be adequately ventilated away from the lungs and its tension in the blood will rise. The respiratory centre will therefore be kept under continual stimulation, which may end in fatigue or which may carry the patient through the operation without untoward event. In the latter case, however, the stimulant is withdrawn when the administration ends and the patient may lapse into grave respiratory or circulatory embarrassment. This phenomenon is well exemplified by the condition known as "cyclopropane shock". Dripps<sup>40</sup> has demonstrated that, in deep anaesthesia with cyclopropane, and despite the abundant oxygenation which goes with it, the depressed respiratory volume leads to an increased tension of carbon dioxide in the arterial blood. It is quite possible that the same mechanism may be operative in other forms of anaesthesia, for example, ether, curare and "high" spinal analgesia. In all, an abundant supply of oxygen must be given and the anaesthetist must stand prepared to supplement shallow respiration by manual "control".

#### "Controlled" Respiration.

The physiological basis of "controlled" respiration can be best appreciated from the consideration of a patient who has been heavily premedicated and then anaesthetized with an agent in itself depressing to the respiration. Both premedicant and anaesthetic affect the respiratory centre, reducing its sensitivity to the carbon dioxide present in the blood. The tension of this gas must therefore rise, so that the centre may be kept at normal activity; a new threshold, in short, is established for the arterial carbon dioxide. The respiration therefore becomes slow, shallow and (in extreme cases) even periodic or irregular, so that enough carbon dioxide may be accumulated in the blood to reach the new threshold and stimulate the respiratory centre to activity. In time, this compensatory process breaks down and respiratory arrest occurs. Long before this, however, the minute-volume of respiration has been progressively reduced and made ever less capable of oxygenating the blood.

If, however, the respiration is prevented from becoming shallow by manual compression of the breathing bag of the soda lime absorption apparatus, at the rate and amplitude which simulate the normal respiratory exchange, the carbon dioxide tension of the blood will be prevented from rising. A state of relative acapnia is produced: the carbon dioxide tension remains below the new threshold value and spontaneous respiration ceases. It will not return so long as the manual compression of the bag is continued. The normal minute-volume of respiration being maintained by artificial means, the oxygenation of the blood will remain unimpaired despite the absence of spontaneous breathing.

The establishment of "control" is therefore easy. It is necessary merely to give reasonably heavy premedication, as with an intravenously given barbiturate, and to follow it with an anaesthetic, such as cyclopropane or ether, which is relatively depressing to the respiration. "Control" is then established by compression of the bag which reproduces the rhythm, rate and amplitude of normal breathing for a patient of that physique. It is the subsequent maintenance of "control" which is difficult. The lungs must not be hyperventilated, lest too much carbon dioxide be washed out of the blood and its acid-base balance be disturbed. If compression of the bag is occasionally suspended, spontaneous respiration should show signs of returning after a period equal to three or four respiratory cycles and before any evidence of anoxia becomes manifest. Spontaneous respiration, for a century the cardinal sign of anaesthesia, is abolished during "control", so that care is necessary not to force an over-

dose of anaesthetic upon the patient. The signs of anaesthesia must therefore be watched with especial care and an ample supply of oxygen assured. "Control", if properly effected, is a safe procedure; if improperly, it is a most unsafe one. There are anaesthetists and surgeons who still imagine that it consists in the abolition of spontaneous respiration by anaesthetic overdosage and the maintenance of life by artificial respiration, which, of course, is far from being the case.

It is possible to "control" the respiration without heavy premedication, and under non-depressing agents such as nitrous oxide, by the practice of hyperventilation, that is, by compression of the bag in excess of the tidal excursion normal for that patient. This course involves some danger of producing alkalosis by excessive washing-out of carbon dioxide from the blood. It is safer to supplement the nitrous oxide with ether or an intravenously given barbiturate, in a dose sufficient slightly to depress the respiration, before "control" is attempted. Once it has been established, the subsequent anaesthesia—whether under nitrous oxide or cyclopropane—can be conducted at a light plane.

The value of "control" is great. It has made modern thoracic surgery possible by eliminating the hazards of "mediastinal flap" and paradoxical respiration. By placing the diaphragm at rest it gives access to deeply placed regions of the thorax and upper part of the abdomen. It allows of the production of temporary apnoea for the ligation of a bleeding-point difficult of access or for the radiography of a viscus mobile with respiration. It is compatible with light anaesthesia in which the patient may from time to time move hand or foot. It is essential for the safe use of curare. At the same time, it is a major anaesthetic procedure which should be attempted only by those who understand clearly the physiological processes involved in it.

#### Curare.

There are several alkaloids possessed of a curariform action. The first to be employed in Australia was "Intocostin" (Squibb) by Marshall and Daly of Sydney in 1945. A second alkaloid, *d*-tubocurarine chloride (Burrhoughs Wellcome and Company), has recently become available here. One milligramme of it is perhaps equivalent to five milligrammes of "Intocostin". It is also probably more stable and more consistent in its effects than is "Intocostin".

The curare alkaloids act by blocking nervous impulses to skeletal muscles at the myo-neural junctions. A similar curarizing action seems to be possessed by ether and, in massive dosage, by thiopentone and tribromethanol. Cyclopropane and nitrous oxide are apparently without curarizing effect. This point is of importance in the determination of the dosage of curare permissible with a given anaesthetic.

Curare acts first upon the muscles innervated by the cranial nerves; then upon those of the limbs and trunk, including the intercostals; finally, upon the diaphragm, causing respiratory arrest. There is a comparatively narrow margin between the dosage which relaxes the glottic or abdominal muscles (1.5 milligrammes of *d*-tubocurarine chloride per stone of body weight) and that which may paralyse the diaphragm (2.0 milligrammes per stone). A curariform substance "Myanesin" (British Drug Houses Limited), is now on trial in England and is reported to cause abdominal relaxation without inhibition of the diaphragm, except in massive dosage. Even so, one may well doubt whether respiration carried out by the diaphragm alone would be effective in oxygenating the blood.

Curare is given by intravenous injection, the effect being fully evident within five minutes and persisting for thirty or even for sixty minutes. Curarization of the conscious subject is too disagreeable to be justified. The curare effect may be prolonged by the injection, as required, of one-quarter or one-third of the initial dose. None should be given, however, within thirty minutes of the close of the operation, lest the patient then prove to be incapable of effective respiration. Finally, it must be always remembered that curare inhibits the intercostal muscles

and, in large dosage, the diaphragm. The respiratory exchange is therefore greatly reduced and "control" is usually necessary to ensure oxygenation. Even when spontaneous breathing persists, it is usually so shallow that carbon dioxide may well fail to be eliminated from the body. Cases of "curare shock", probably analogous to "cyclopropane shock", have been reported. The anaesthetist must therefore be prepared to "assist", if not absolutely to "control", the respiration for so long as the curare effect is evident. By "assisted" respiration is meant manual compression of the bag which follows the inhalations and, whilst not necessarily abolishing spontaneous respiration, at least ensures that the tidal volume of respiration remains normal for a patient of that physique.

None of the curare alkaloids has any analgesic effect whatever, as was dramatically shown by Smith<sup>40</sup> and his co-workers, who gave to a conscious volunteer a dose two and one-half times that which produces total respiratory paralysis. It is hence possible in theory for a curarized patient to awaken under unduly light anaesthesia and to feel pain, the existence of which he cannot make known owing to the muscular paralysis. The literature therefore stresses the signs of lightening anaesthesia, namely, accelerated respiration, accelerated pulse and jerky contractions of the diaphragm. In practice, however, it seems probable that, with the dosage of curare stated above, the patient will always give warning of unduly light anaesthesia by movement.

The clinical use of curare may be illustrated by reference to an abdominal operation. Probably the safest plan is to induce anaesthesia with cyclopropane. Time should be allowed for the patient to become stabilized in the deeper first plane. Note should be taken of the percentage mixture which produces this result; the patency of the air passages should be established and the accurate coaptation of the mask be checked. Then, when all is proceeding well, *d*-tubocurarine chloride should be given intravenously in a dose of 1.5 milligrammes per stone of body weight. The effect will become manifest in about two minutes, the muscles relaxing and the respiration becoming shallow, if not actually ceasing. It may be "assisted", by means of the gas anaesthesia apparatus, so as to prevent anoxia. After five minutes, the larynx may be intubated without spasm being evoked, which would otherwise occur at this light plane of anaesthesia with cyclopropane. Intubation is desirable, both to facilitate "control" and to prevent obstruction due to the paralysis of the pharyngeal and laryngeal muscles. "Control" should now be established because, although diaphragmatic respiration may persist, its volume is usually insufficient for proper respiratory exchange. The operation may now commence, the single dose of curare often sufficing for the surgeon's needs. "Controlled", or at least "assisted", respiration is continued until spontaneous breathing again becomes obviously sufficient. It is unwise to give more curare for closure of the peritoneum. If this cannot be done under light anaesthesia with cyclopropane, resort should be made to ether supplement. Thiopentone supplement is often advocated, but it may delay the patient's recovery of control over his own respiration at the end of the operation.

Curare must be used cautiously with ether, which of itself has a curarizing effect. The combination of nitrous oxide with curare offers difficulty, for this gas has low anaesthetic potency. The patient may therefore attempt to expel the endotracheal tube unless the oxygen supply is restricted to an undesirable extent, or unless the dose of curare is on the heroic scale described by Harroun.<sup>41</sup> Nitrous oxide has been used successfully when supplemented with ether, as described by Clement<sup>42</sup>, or with thiopentone, as described by Knight<sup>43</sup>; cyclopropane, however, is probably the best adjuvant for use with curare.

The combination of thiopentone with curare has attractive simplicity, but is probably less safe than is that of cyclopropane and curare. Since both thiopentone and curare are respiratory depressants of the most potent order, safety can be obtained only by laryngeal intubation and the administration of oxygen by mask and bag, so that the respiration may be "assisted" or "controlled".

The technique is therefore no easier than is that with cyclopropane; it has, too, the drawbacks associated with the prolonged administration of thiopentone.

Whilst not advocated for prolonged anaesthesia, the combination of thiopentone with curare is often useful as a means of facilitating intubation of the larynx. An hypnotic dose of thiopentone, of the order of 0.5 gramme, is given intravenously; the needle is flushed with saline solution to free it of barbiturate and so prevent precipitation of the tubocurarine. The latter is then injected in a dose of 1.5 milligrammes per stone of body weight. After two or three minutes the larynx may be intubated without provocation of spasm. A drawback to the method is the definite suboxygenation, due to the combined depressant effects of the thiopentone and curare, during the period of waiting. Orton therefore gives the curare first, following it quickly by the thiopentone, so that consciousness may be abolished before the patient becomes disagreeably aware of the curare effect. This form of induction is used by many workers for certain endoscopic procedures, oxygen being insufflated during the operation and for as long afterwards as may be necessary. It is also used as a prelude to cyclopropane anaesthesia, greatly expediting induction and the establishment of "control", although offering less margin for error than does the plan described in an earlier paragraph.

In conclusion, the drugs of the curare group are still in a developmental stage. Their use is far from being safe if the anaesthetist is not familiar with their pharmacological effects and with the technique of "controlled" respiration.

#### The Gaseous Anaesthetics.

##### *Cyclopropane.*

The popularity of cyclopropane as an anaesthetic agent is due to its potency and to the abundant supply of oxygen which may be given with it. Its value in actual or potential anoxia of the anoxic type is therefore obvious: it has won its place in thoracic surgery and in states of respiratory obstruction. Its use in abdominal surgery is more questionable. Orton has drawn attention to the fact that, under cyclopropane, the abdomen is not so much relaxed as quiescent, the quiescence being due to shallow and depressed respiration. The latter is inseparable from deep anaesthesia with cyclopropane: it results, as already described, in undesirable retention of carbon dioxide. Moreover, it is in deep anaesthesia that the deleterious effects of cyclopropane upon the conductive tissues of the heart are most evident. It follows that, where anaesthesia must be deep, the respirations should be at least "assisted". Curare has made it possible for major operations to be performed at a comparatively light plane of anaesthesia with cyclopropane. The hazards of laryngeal spasm and of cardiac arrhythmia have been reduced in consequence, but the need for "controlled" or "assisted" respiration has been made imperative.

Mention should be made in passing of the importance of "weaning off" in the final stages of an administration of cyclopropane. The patient has been breathing an anaesthetic mixture containing 80% or 90% of oxygen. By the gradual admission of nitrous oxide or of air this percentage is reduced to approximately that of the atmosphere before the administration ends. The result is a reduction in the incidence of post-operative circulatory depression and of pulmonary atelectasis.

##### *Nitrous Oxide.*

Nitrous oxide is an agreeable anaesthetic and is almost devoid of toxicity. It is, however, weak: it cannot produce anaesthesia of the second plane of the third stage without anoxic manifestations. McKesson<sup>44</sup> sought to compensate for this lack of potency by restricting the supply of oxygen, but this technique has been discarded by most anaesthetists as unsafe. Muscular relaxation, indeed, is better where the supply of oxygen is adequate than where it is deficient.

Reference to the dissociation curve of haemoglobin will show that the oxygen content of the inhaled atmosphere can be reduced to 15% without material unsaturation of the haemoglobin; further reduction causes rapid and



serious unsaturation. It is probable, however, that mixtures containing even 15% of oxygen should be given for short periods only, every effort being made to raise the percentage to at least twenty. In practice, this will mean that volatile supplement will be often necessary in nitrous oxide anaesthesia. Its use has no real drawbacks. It does not add materially to the incidence of respiratory or circulatory depression, of after-sickness or of respiratory sequelae; anoxia, however, contributes to all three.

The use of minimal ether supplement therefore adds the curarizing effect of ether to the agreeable properties of nitrous oxide. It makes possible a fair degree of muscular relaxation without limitation of the supply of oxygen. It is probably a safer means of producing deep anaesthesia, as for operations upon the upper part of the abdomen, than is cyclopropane unaccompanied by curare and "controlled" respiration. If ether supplement is contraindicated, other agents, such as trichlorethylene, vinyl ether or the intravenously given barbiturates, may be employed according to the circumstances. With all such combinations, however, it should be remembered that the oxygen percentage is not far above the atmospheric. Cyclopropane may therefore be a wiser choice than any in cases of actual or potential anoxia, especially if of the anoxic type.

#### Volatile Anaesthetics.

##### Ether.

Despite the rapid progress of newer anaesthetic agents, ether remains the best for the non-specialist anaesthetist. Interest has centred of late upon its administration by means of wide-bored inhalational vaporizers, such as the Oxford. The drug may thus be given in controlled percentage and at room temperature, with minimal bronchial stimulation and correspondingly quiet breathing. Thus given, ether has proved to be less depressing, less provocative of after-sickness and less irritating to the lungs than was imagined a decade ago.

The Oxford vaporizer is admirable, but it has not yet reached finality in design. The repeated fillings with hot water required to operate the chemical thermostat often lead to cracking of the plastic case with liberation of the calcium chloride and destructive corrosion. The standard valve-gear was apparently designed originally for use with a continuous-flow system and is of inadequate bore for inhalation. The substitution of valve-gear of more modern design, with wide-bored channels and sensitive valves, produces much quieter respiration. A drip feed for ethyl chloride is preferable to the bag supplied, of which the defects are obvious.

The use of a vaporizer is a short cut to good anaesthesia with ether; it is not essential to it. Renton and Watson<sup>(1)</sup> have demonstrated that "open" administration can yield, in skilled hands, results comparable with those given by any vaporizer. The prerequisites are gradual and progressive induction, administration at an even rate adjusted to the needs of the moment, patency of the air passages and the provision of an ample supply of oxygen.

##### Trichlorethylene.

On its introduction, trichlorethylene was hailed as "chloroform without its toxicity". This enthusiastic verdict has had to be revised. Whilst the effect of the drug upon the heart has not been fully evaluated, fatalities have been reported which suggest primary cardiac arrest of the type usually associated with chloroform. Electrocardiographic studies by Waters and his associates<sup>(2)</sup> suggest that trichlorethylene can, like chloroform, excite ventricular extrasystoles of the ominous multifocal type.

Trichlorethylene is best administered by means of a wide-bored inhalational vaporizer, such as Marrett's.<sup>(3)</sup> Either this apparatus or a simple bulb-operated vaporizer may be used for self-administration in midwifery. Trichlorethylene can be used to supplement the gaseous anaesthetics, provided that carbon dioxide absorption is not practised; the heat and alkalinity of the soda lime will decompose the anaesthetic into dichloroacetylene, a noxious substance. When trichlorethylene is used as supplement to the gaseous anaesthetics, it is well to maintain an oxygen percentage of not less than twenty.

Trichlorethylene is a somewhat unpredictable anaesthetic agent. Muscular relaxation is sometimes attained at a light plane; at other times it is preceded by a sinister increase in the respiratory rate. The latter is rarely below forty cycles per minute in the third stage of anaesthesia; in massive dosage it may rise to sixty cycles or more and be followed by apnoea. These changes are apt to be accompanied by pallor, bradycardia and cardiac arrhythmia and to be followed by post-anaesthetic vertigo and nausea. Hence, no attempt should be made to obtain muscular relaxation at the price of a concentration of vapour which produces tachypnoea; rather should a change be made, at least temporarily, to ether.

Trichlorethylene is an agreeable anaesthetic agent, its use being followed by a comparatively rapid recovery and a low incidence of after-sickness. Induction is slow unless preceded by the administration of ethyl chloride. Trichlorethylene is non-inflammable and non-irritating to the lungs. There is no evidence that it damages the liver, as does chloroform. Capillary oozing is less than occurs under ether. Trichlorethylene appears to diminish the pharyngeal and laryngeal reflexes and to admit of laryngeal intubation at a light plane which would, under ether, be attended by spasm. It is therefore popular with laryngologists. Despite these advantages, trichlorethylene is not a satisfactory anaesthetic agent. It is inapplicable to abdominal or thoracic operations since with it tachypnoea precedes muscular relaxation. It is unlikely to displace the older anaesthetic agents for peripheral operations, if only because its effect upon the heart is still uncertain. Its scope seems to be limited to cases in which the danger of fire exists or in which an agent is required which will not irritate the lungs. It is also an efficient analgesic for use in midwifery.

#### Spinal Analgesia.

Spinal analgesia has always been subject to waves of alternating enthusiasm and distrust. We stand at the end of a period of enthusiastic revival. The chief major advance in technique has been continuous, or more correctly "intermittent", administration. The present writer has not had experience with it. The 1% solution of procaine seems to have become generally accepted as the best agent. The search for a sterilizable and unbreakable cannula presented difficulty and has been solved, in one hospital in Melbourne, by the use of a ureteric catheter of polyvinyl-acrylic resin, which can be sterilized by boiling.

For operations of average duration single-dose administration still prevails. Techniques seem to be crystallizing into the use of a small volume of a hyperbaric solution for sacral block and that of a hypobaric solution (usually of "Nupercaine") for "high" thoracic block. In lumbar and lower thoracic block the choice of agent is determined by personal preference.

Circulatory depression is rare in sacral block, is unusual in lumbar or lower thoracic block, and is almost consistently present in block of the upper thoracic segments. Its aetiology is still debatable. An obvious factor is the stagnant anoxia brought about by the stagnation of blood in the paralysed muscles and by the interruption of the cardio-accelerator nerves which occurs should the block extend to the fourth thoracic segment. To these elements of stagnant anoxia must be added the anoxic anoxia resulting from intercostal muscular paralysis and consequent pulmonary hypoventilation. It follows that mere administration of "Neosynephrin" or other analeptic is not sufficient treatment for circulatory depression. Oxygen therapy is also needed, and in extreme cases the intravenous infusion of serum or plasma. Oxygen therapy combats the anoxia which results from the partial respiratory paralysis: it does not, however, aid the elimination of carbon dioxide, for which purpose an adequate respiratory exchange is necessary. It is therefore possible that manual "assistance" to respiration is as desirable under "high" spinal analgesia as it is under deep anaesthesia with cyclopropane. To make it tolerable to the patient the analgesia would, of course, need to be supplemented by very light anaesthesia with a gaseous anaesthetic.

In a recent review of the results of spinal analgesia in two major hospitals of Australia<sup>(4)</sup> the method was found



to yield an immediate mortality of 2.7 per 1,000 cases. This was higher than the mortality under nitrous oxide (1.6 per 1,000, although used for the worst operative "risks") or under ether (0.5 per 1,000). Further analysis showed, however, that the mortality under spinal analgesia was small among "good risk" patients. In eleven fatalities, only one patient was of this class; the others were aged or debilitated and were subjected to major operations, particularly for the relief of intestinal obstruction. This fact accords with the view widely expressed in the current literature, that spinal analgesia is unduly hazardous in the presence of obstruction.

In the same review the sequelæ of spinal analgesia were worked out for a series of 2,155 administrations in the one hospital. Whilst this number is too small for definite conclusions to be drawn from it, the results are at least suggestive. Post-analgesic headache, for example, was observed in 7.1% of cases. It was more common after sacral or lumbar block than after thoracic, a fact which may be related to the widespread use of small volumes of concentrated solutions for the production of "saddle" analgesia. Again, respiratory sequelæ were noted in 7.4% of cases. They were more frequent after thoracic block than after lumbar or sacral. This fact is possibly to be explained by the intercostal paralysis and pulmonary hypoventilation which accompany "high" spinal analgesia and by the quiescence enjoined upon the patient for some hours after his return to bed. A respiratory sequel rate of 7.4% is high in comparison with inhalational anaesthesia, which shows an incidence of perhaps 0.6% in civilian practice and 2.6% in military.<sup>(10)</sup> A need would thus seem to exist for effective "stir-up" treatment as soon as is practicable after "high" spinal analgesia. The principles of this treatment are set out below.

#### Muscular Relaxation.

Attention has been drawn by Orton to the fact that relaxation of the upper part of the abdomen is obtainable only when the intercostal muscles are paralysed. This state can be produced by deep inhalational anaesthesia, by curare or by spinal analgesia. In each case, the paralysis of the intercostals, which are muscles of respiration, will involve diminution in the pulmonary ventilation. Hence, for safety's sake, the patient must be supplied at this stage with an atmosphere rich in oxygen. If the respiration still remains shallow, the anaesthetist will need manually to "assist" it so as to ensure adequate elimination of carbon dioxide.

Muscular relaxation, of the upper part of the abdomen in particular, is of understandable importance to the surgeon. It can be obtained only at the price of respiratory depression. Of available means, the curare alkaloids seem to be the most hopeful. It cannot be over-emphasized, however, that these drugs are not yet safe even in skilled hands. They are still in the developmental stage and their potentialities can hardly be predicted. It seems unlikely, however, that curare or its substitutes will ever prove able to relax the muscles of the upper part of the abdomen without also paralysing the intercostals, for the same innervation is concerned in each case. The problem of obtaining abdominal relaxation with safety still awaits final solution.

#### Sequelæ of Anaesthesia.

The anaesthetist's responsibilities are no longer regarded as having ended with the departure of a living patient from the operating theatre to the ward. They are extended, morally at least, to the post-operative period. The anaesthetist is now expected to minimize and, in some degree to treat, the possible sequelæ of anaesthesia. Of these, two will be selected for comment, namely vomiting and respiratory infection.

#### Post-Anæsthetic Vomiting.

Of the anaesthetics in general use, thiopentone produces the least after-sickness. After the gaseous anaesthetics, vomiting is usually slight and is often absent. Even with ether, the incidence and severity of vomiting are much less than was formerly the case. To this happy result several factors have contributed, such as the routine administration of carbohydrate in the evening before

operation, the improvement in anaesthetic apparatus and the emphasis set upon adequate oxygenation and free elimination of carbon dioxide.

It sometimes happens that despite all precautions and the use of an agent which is not ordinarily nauseating, severe after-sickness still occurs. Anaesthetists have been much puzzled by this fact, which they have had to attribute to some obscure biochemical dysfunction. A ray of light has been shed in a recent paper by Trethewie.<sup>(11)</sup> It has been known for some years that when animals are anaesthetized with ether, a deaminating enzyme is liberated into the blood and interferes with the metabolism of protein by the liver. Trethewie has shown that this liberation occurs also in man under ether, but not under local or spinal analgesia. He has not yet extended his studies to the other volatile or gaseous anaesthetics or to the intravenously given barbiturates. They offer, however, a possible clue to the reason for excessive vomiting after anaesthesia in some unfortunate subjects.

#### Respiratory Infection.

The atelectatic factor in post-operative respiratory infection is now well recognized. In its lobar form the condition is known as "massive collapse of the lung". It produces anoxia so severe as to constitute a respiratory emergency and its treatment is bronchoscopic aspiration.

Lobular atelectasis runs the subacute course which is familiar to all. The anaesthetist can take precautions against it both during and after the operation. The operative precautions include the use in appropriate cases of non-irritating anaesthetics so as to minimize bronchial congestion and secretion. They include also the use of the endotracheal tube, of the inflatable cuff or pharyngeal pack and of tracheal aspiration as suggested by Cobb.<sup>(12)</sup> The last-mentioned procedure is employed less often than it should be. It often converts a difficult administration into an easy one by removing the secretions which hinder respiration, excite coughing, disseminate infection throughout the lungs and favour atelectasis. Even when the administration has not been endotracheal, it is often wise to carry out intubation at the end of the operation so that aspiration may be performed. There should be no hesitation about doing so if there has been excessive secretion normal or abnormal, or if entry of blood or foreign matter into the trachea is so much as suspected. The aspirational catheter is passed down the endotracheal tube. When it strikes the carina the patient will cough energetically: much of the secretion in his bronchi will be expelled into his trachea and can then be aspirated.

"Stir-up" treatment, as described by Waters,<sup>(13)</sup> should be given post-operatively to all patients and especially to those who have undergone abdominal, thoracic or inguinal operations. The aim is to promote mobility in bed and expand the lungs. The patient is therefore encouraged to move about, to cough and to inhale deeply at hourly intervals. It is where this régime is best enforced by the surgeon and nursing staff that the incidence of respiratory infection is least. Carbon dioxide therapy, so popular a decade ago, is now realized to be but a poor substitute for the expansive efforts of a co-operative patient.

Should atelectasis develop in spite of these measures it is important to overcome it before the collapsed area of lung becomes infected by the patient's own respiratory flora. "Stir-up" treatment should be intensified and combined with the giving of sulphonamides and of penicillin. Should improvement not result within twenty-four hours, the "tracheobronchial toilet" of Waters should be tried. In this the nose and larynx are made insensitive by means of the cocaine spray. A small Magill's tube, approximating to No. 2, is then passed through the nose into the trachea and the latter is aspirated through it.<sup>1</sup> Should this not

<sup>1</sup> This technique is open to criticism, in that should the patient's vocal cords close upon the tube his pulmonary alveoli will become deflated. In the classical technique, a larger tube (say, No. 6-8) is inserted into the trachea and an aspirational catheter passed down it. The difficulty here is that a nasotracheal tube may be so bent and flattened by the pressure of the turbinate bones that, whilst its total sectional area remains unchanged, it is often no longer possible to pass an aspirational catheter through it.

overcome the atelectasis, resort must be had to bronchoscopic aspiration.

#### Conclusion.

Anæsthesia in 1947 is a highly technical branch of medicine. For a century the anæsthetist has been dominated by the patient's physiological reactions and able to do only what the patient allowed him to do. Today, in the case of respiration, he can control the patient's response to anæsthesia and thus give added safety. When he can control the circulation as he now controls the respiration, anæsthesia will at last become safe.

In conclusion, a plea is made for better records. Medical men are, as a group, swayed too much by clinical impressions. These have but little value unless based upon experience which is wide and carefully recorded. This is true especially of bad results, which are apt to be repressed into the subconscious because their recollection is painful. Yet it is from our mistakes that we should learn most.

The records of any individual have but limited statistical value, since their total is small enough to be affected profoundly by chance eventualities. The records of institutions are free from this criticism, but are apt to suffer from a diversity of criteria. If a group of individuals can be induced, however, to keep records upon a standardized system their results will have statistical value. The Nosworthy<sup>(7)</sup> punch-card system of recording is simple, efficient and within the scope of every anæsthetist or surgeon. It allows a mass of data to be sorted rapidly and accurately and a solution to be found for quite complicated problems which involve a number of correlations. As an example, the writer had occasion lately to find out, from the unsorted records of five months, just how many patients had suffered from vomiting of different grades of severity after oral surgical operations performed under, respectively, ether, nitrous oxide, and trichlorethylene. The answer was forthcoming within less than ten minutes.

The Nosworthy system is not ideal, but it has the merits of simplicity and uniformity. It has been adopted as a standard by the anæsthetists of Great Britain and could be employed to advantage throughout the British Commonwealth. Its principles could be applied with equal success to the keeping of surgical records.

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#### AN INVESTIGATION OF LIVER FUNCTION IN NORMAL PREGNANCY AND IN THE LATE TOXÆMIAS OF PREGNANCY.

By E. M. A. DAY,

Fairfax Institute of Pathology, Royal Prince Alfred Hospital, Sydney.

and

A. L. HELLESTRAND,

Fellow in Obstetrics and Gynæcology, King George V Memorial Hospital, Sydney.

It is well known that the liver suffers severe damage in eclampsia and that typical changes are demonstrable post mortem, so typical in fact that Browne<sup>(1)</sup> considers them "sufficient to warrant a post-mortem diagnosis of eclampsia". The cause of this liver damage is not known. It seems reasonable to assume that if such marked pathological changes are demonstrable in toxæmia in its fullest manifestation, that is eclampsia, changes of less magnitude might be expected to be present in the milder forms of the toxæmias.

Several biochemical procedures designed to test different aspects of liver function have been developed in recent years, and certain of these have been used in the investigation of the toxæmias of pregnancy. Krebs and Dieckmann,<sup>(2)</sup> using the Rosenthal liver function test, claim that the test seems to offer considerable promise in indicating the degree of toxicity in certain cases, and gives a better idea of how to evaluate patients' symptoms and "the functional capacity of the liver under the added strain of pregnancy". On the other hand, Stander<sup>(3)</sup> concludes that only rarely is sufficiently important information obtained to warrant the institution of routine liver tests in patients suffering from toxæmias of pregnancy. Sloman,<sup>(4)</sup> using the hippuric acid excretion test, was not able to show any significant deviation from the normal in toxæmic patients. With the object of determining whether any other liver function tests could show differences between normal and toxæmic pregnant women, and whether the results of such tests might be used to forecast the onset of toxæmia or indicate its gravity, an examination of the cephalin-cholesterol flocculation, Lange gold curve, acid and alkaline phosphatase level of the serum and the total serum protein level has been made in a series of normal and toxæmic pregnant women.

The patients examined were 100 who were admitted to the wards of the King George V Memorial Hospital with a diagnosis of toxæmia of pregnancy, and a control series of 101 patients attending the ante-natal clinic in whom pregnancy was considered normal up to the time of the test. The criteria of normality were: blood pressure below 135 millimetres of mercury (systolic) and 85 millimetres (diastolic), absence of albuminuria and oedema, with no excessive gain in weight. For the cephalin flocculation test the original technique of Hanger<sup>(5)</sup> was used. The precautions he stressed in the preparation of the emulsion and the use of fresh serum were strictly observed. The results were read at the end of twenty-four and forty-eight hours. The colloidal gold was prepared by the method of Borowskaja,<sup>(6)</sup> which has been found most reliable in cerebro-spinal fluid examinations in this laboratory. Dilutions of serum 1:10, 1:20, 1:40, 1:60, 1:160, 1:320, 1:640, 1:1230 in 0.4% sodium chloride solution were used. The acid and alkaline phosphatase levels were determined by the method of King and Armstrong<sup>(7)</sup> as modified by Benotti et alii<sup>(8)</sup> at pH 4.9 and pH 9.0; the results are expressed as King units. The copper sulphate method of Phillips, Van Slyke et alii<sup>(9)</sup> was used for the determination of serum protein levels. All the tests were carried out within twenty-four hours of the drawing off of serum. All the tests were not made on all the patients, as it was sometimes difficult to obtain sufficient blood, particularly from toxæmic patients who were oedematous and who were having intensive intravenous therapy, and also because it was not always possible to carry out all the laboratory tests within a twenty-four hour limit. A total of 650 tests was performed on 201 patients.

TABLE I.

Clinical Classification.	Result of Cephalin-Cholesterol Flocculation Test.						Serum Phosphatase Levels.					Result of Colloidal Gold Test.		Total Serum Protein Content.	
	Negative.		Positive.		Trace.		pH 4.9.		pH 9.		Number of Cases.	Positive.	Negative.	Grammes per Centum.	
	Per-centage.	Number of Cases.	Per-centage.	Number of Cases.	Per-centage.	Number of Cases.	Mean.	Range.	Mean.	Range.		Number of Cases.	Number of Cases.	Mean.	Range.
Normal pregnancy ..	74	74	22.5	23	3.5	4	1.9	Nil-4.8	2.4	Nil-6	75	2	25	6.1	5.5-6.7
Toxæmia of pregnancy	79	79	16.0	16	5.0	5	2.2	Nil-4.8	2.5	Nil-9.5	50	Nil	23	5.7	5.1-6.3

## Results.

The results of the tests are shown in Table I.

Hanger<sup>(6)</sup> in his original description of the cephalin-cholesterol flocculation test, and in further applications of it to clinical cases, claimed that it was "an index of the activity of liver damage rather than of residual function". He suggests as a probable mechanism the capacity of an altered globulin constituent of serum to become affixed to the colloidal element of the cephalin-cholesterol emulsion. Other workers using this test have reported anomalous results due possibly to varying degrees of sensitivity of the emulsion. There seemed in this series to be occasions on which an undue number of positive reactions occurred. In one series of 21 consecutive tests performed on one day there were 14 positive reactions and four trace-positive reactions. This series was repeated next day with a different emulsion, when there were 12 positive and three trace-positive reactions. All the trace-reactions of the previous day were now absent, as was one reaction previously positive. No test previously producing a negative gave a positive result.

A correlation of the results of the test with the clinical evaluation of the toxæmia is given in Table II. The clinical classification shown in Table II is as follows.

## Preeclamptic Toxæmia.

**Mild Preeclamptic Toxæmia.**—Blood pressure between 140 millimetres of mercury (systolic) and 90 millimetres (diastolic) and 160 millimetres of mercury (systolic) and 100 millimetres (diastolic) with mild oedema and albuminuria and mild symptoms.

**Severe Preeclamptic Toxæmia.**—Blood pressure above 160 millimetres of mercury (systolic) and 100 millimetres (diastolic) with marked oedema and albuminuria, accompanied by severe symptoms as headache, blurred vision, epigastric pain and vomiting. This group includes five patients who developed eclampsia with convulsions and two patients who died from the severity of the toxæmia, but without having convulsions.

## Hypertensive Toxæmia.

Blood pressure above 140 millimetres of mercury (systolic) and 100 millimetres (diastolic), but with no more than a cloud of albumin in the urine, and little, if any, clinical oedema.

## Nephritic Toxæmia.

Patients who gave a history suggestive of nephritis or pyelonephritis and who had poor renal function as measured by the urea concentration test, with a blood urea content above 40 milligrammes per centum. An essential of the diagnosis in these cases was the onset of symptoms early in pregnancy.

Although a final diagnosis in toxæmia of pregnancy can be made only after a complete post-natal follow up, it was felt that the above classification on clinical and laboratory findings might be useful in suggesting the possible degree of liver damage.

## Discussion.

The tables show that there was no correlation between the type or severity of the clinical condition and the result of the test. Five patients in the severe preeclamptic state later developed eclampsia—four of these failed to react to cephalin flocculation tests; one gave a trace-positive reaction. Two patients died; both failed to react to flocculation tests. One of these patients was a *primipara* with a frank breech presentation and a relatively small pelvis. A Cesarean section was performed under nitrous oxide, ether and oxygen anaesthesia. The patient collapsed suddenly at the end of the operation, was resuscitated and died five hours later. At post-mortem examination a large pale liver showing marked fatty degeneration was found. The other death was that of a patient whose toxæmia was so severe that labour was induced at the thirty-sixth week of pregnancy by stripping the membranes; this was followed in twenty-four hours by artificial rupture of the membranes. The patient had inertia and was delivered of a stillborn child after thirty-six hours. Four hours after delivery she developed headache, vomiting, epigastric pain and low blood pressure. Twenty-four hours later she was jaundiced and developed pyrexia. She died thirty-six hours later without having any convulsions. Post-mortem examination showed a typical eclamptic liver with areas of hemorrhage, necrosis and fatty degeneration.

As 22.5% of the normal pregnant women gave positive results, a further examination and follow-up of this group was made, and the results are shown in Table III. The only observation that can be made is that three times as many patients in the normal group with positive results developed toxæmia, as in the normal group with negative results.

TABLE II.  
Cephalin Cholesterol Flocculation Tests. Further Analysis of Results in Toxæmic Patients.

Clinical Classification.	Negative Result.		Positive Result.		Positive Trace Result.	
	Percentage.	Total Number.	Percentage.	Total Number.	Percentage.	Total Number.
Preeclampsia—						
Mild .. .. .	22.8	18	50.0	8	—	—
Severe .. .. .	32.9	26 <sup>1</sup>	12.5	2	—	4 <sup>2</sup>
Hypertension .. .. .	41.8	33	25.0	4	—	1
Nephritic toxæmia .. .. .	2.5	2	12.5	2	—	—

<sup>1</sup>Includes four patients who developed eclampsia.

<sup>2</sup>Includes one patient who developed eclampsia.



TABLE III.  
Cephalin-Cholesterol Flocculation Tests. Further Analysis of Results in Normal Pregnant Women.

Clinical Course.	Result of Test.					
	Negative.		Positive.		Trace.	
	Percentage.	Number of Cases.	Percentage.	Number of Cases.	Percentage.	Number of Cases.
Remained normal .. ..	92.1	70	78.3	18	75.0	3
Developed pre-eclampsia ..	5.3	3	17.3	4	25.0	1
Developed hypertension ..	2.6	1	4.3	1	—	—
Total .. ..	—	74	—	23	—	4

Alkaline phosphatase examinations have been advocated as a means of differentiating between different types of jaundice (Roberts<sup>(10)</sup>). The enzyme is excreted in the bile and in obstruction has sometimes been found to accumulate in the blood. The phosphatase levels in pregnancy have been examined by Bodansky, Campbell and Ball,<sup>(11)</sup> who found normal values in 83% of the patients up to the seventh month, and levels above normal in 80% of patients in the ninth month. Jones and Shinowara<sup>(12)</sup> found increased acid and alkaline phosphatase activity after hypophysectomy in the rat, an observation which may be of significance in the subject under investigation, as an endocrine basis for toxæmia has been suggested.

In this series observations were made on 75 normal pregnant women and on 50 women suffering from toxæmia. There is no difference between the average levels of alkaline phosphatase—in both cases they are low. The range in the normal group is from nil to six units *per centum*—two patients had readings of six units *per centum*; one of these had had a partial thyroidectomy two years previously, the other had a toxæmia in a previous pregnancy. Both were clinically normal. In the toxæmic group the variations were between nil and 9.6 units *per centum*. Five patients had readings of six units *per centum* and over. In none of these was the toxæmia particularly severe; in the case of two of them the pregnancy was post-mature, but another toxæmic patient, whose pregnancy was three weeks beyond the expected date of confinement, had a low phosphatase level. In both series the acid phosphatase level did not rise above 4.3 units *per centum*. Low levels were equally distributed among both groups of patients.

The colloidal gold reaction is considered to be an indicator of active hepatic disease and to depend on alterations in the relative amounts of globulin and albumin in the serum. In the case of two normal pregnant women there was some reduction of the gold solution, one with slight reduction at a dilution of 1:40, the other with stronger reduction (grade 3) at 1:80 dilution. Gray<sup>(13)</sup> regards reduction at a dilution of 1:60 as significant, and in his test this is the only one set up. In MacLagan's<sup>(14)</sup> modification a dilution of 1:100 is used.

The difference in level of the serum protein in normal pregnancy and in toxæmic pregnancy was very slight. In this series the normal pregnant woman is at the lower level of the normal non-pregnant range. The toxæmic patients had serum protein levels slightly below this.

Sherlock<sup>(15)</sup> in a recent investigation of hepatic disease, has found that variations in the albumin fraction are significant in acute hepatitis.

#### Summary and Conclusions.

The results of the cephalin-cholesterol test and of the colloidal gold test, the levels of the acid and alkaline phosphatase, and the total serum protein content have been determined in a group of normal pregnant women and in a group suffering from the toxæmias of pregnancy.

The cephalin-cholesterol flocculation test was found to yield a positive result more frequently in normal pregnant

women than in toxæmic pregnant women. There was no correlation between the result of the test and the severity of the condition among toxæmic patients. Among the control patients 17.3% (that is, four out of 23) of those with positive reactions and 5.3% (that is, three out of 74) of those with negative results later developed a toxæmia of pregnancy.

No difference is shown between the acid and alkaline phosphatase levels of normal pregnant and toxæmic pregnant women.

The colloidal gold test yielded no positive results during the toxæmias of pregnancy.

The serum protein levels agree with the findings of other observers.

#### Acknowledgements.

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## THE NEED FOR A MEDICAL LIAISON OFFICER IN PEACE AND WAR.

By STANLEY GOULSTON,  
Sydney.

The British Army did not take kindly to the idea of liaison. The value of horizontal liaison, that is, keeping in touch with neighbouring units, has never been disputed. It is the value of vertical liaison which appeared more doubtful to the British.<sup>1</sup>

### Part I. Growth of the Medical Services in War.

As modern warfare expands in complexity and totality, medicine plays an increasingly important rôle. We now have modern, efficient medical services, ably directed, and responsible for the health of the men and women of the navy, army and air force.

Medical responsibility increases with each campaign in each war, and the efficiency has kept pace. The last great conflict threw tremendous strain on medical science and resulted in the complete control of almost all the diseases that had ravaged the great armies of history—typhus and typhoid fevers, malaria, the dysenteric diseases. Once these diseases determined the outcome of the military venture. Today their importance is almost negligible. Australia can indeed be proud of her contribution in the tropical medicine field, and in particular in malaria, scrub

the service to his final discharge. He is carefully examined and graded according to his physical and mental attributes; he is watched and cared for throughout his service, guarded and protected against mental trauma or physical illness, tended when injured or sick, and rehabilitated for civil life at the end of his war career.

Expert advice is required to prevent or suppress illnesses to allow him to fight in disease-ridden parts of the world, to provide him with the requisite calories, minerals and vitamins, to maintain his supply of drinking water, to teach him the value of personal cleanliness and hygiene relevant to his geographical position.

Medical responsibility in war now covers an enormous field. The advances made during the last conflict have not been previously equalled. The General Staff has come to realize the value and indispensability of the medical services, and to ask their counsel from the earliest stage in the planning of the campaign. Help is needed in the construction of aircraft, tanks and army fighting vehicles with a view to the comfort and efficiency of those who are to fight in them, and to the extraction therefrom of the wounded. Advice is needed in the design for suitable clothing in arctic, tropical and temperate climates. Men must climb to vast heights, and stay for long periods under water, and they must be maintained in health and efficiency.

The evolution of new chemotherapeutic drugs, insecticides and repellents, the increasing use of preventive measures such as inoculation and vaccination against bacterial and virus infections, the amazing advances in surgical technique, the speedier methods of evacuation from the battlefield, are well known; but these represent but a few of the advances made. The war just concluded saw the introduction of many new types of medical units such as commando and parachute field ambulances, anti-malarial and entomological units, forward surgical units and special surgical teams. New types of equipment were invented and their packing and air dropping became a skilled process.

In a global war it is essential that each member of an allied fighting team knows what the other members are doing. The medical services are no exception. In this war the Australian services became highly skilled in methods for combating tropical diseases, long before Britain and America. British preparations for the South-East Asia Command campaigns were made much easier by Australian experience. The Canadian medical services excelled among other things in the study of nutrition and night blindness. In Britain outstanding advances were made in surgical technique and in the extension of this technique to the battlefield in the form of special neuro-surgical, facio-maxillary and plastic units, in a magnificent home-controlled transfusion service under Sir Lionel Whitby's able direction, and in the chemotherapy of the sulphonamides and penicillin.

### Part II.

#### The Medical Coordination Scheme in London, 1939-1946.

The Director-General of Army Medical Services at the War Office was assisted by a skilled team comprising twelve directorates. His immediate assistants were the Deputy Director-General of Army Medical Services (Operations) and the Deputy Director-General of Army Medical Services (Administration). He had a Consultant in Medicine, Consultant in Surgery,<sup>1</sup> Director of Pathology, Director of Hygiene, all with the rank of Major-General, and a team of consultant advisers, which represented the best civilian medical brains at the country's disposal and on whose judgement he could afford to rely implicitly. These directors and consultants were also coopted to serve on special committees convened by the Medical Research Council, which tackled such diverse subjects as army fighting vehicles, chemotherapy, jaundice, malaria, protein requirements, arterial surgery, *et cetera*.

<sup>1</sup> The Australian Army Medical Corps medical directorate at Land Headquarters had a Director of Medicine and a Director of Surgery.

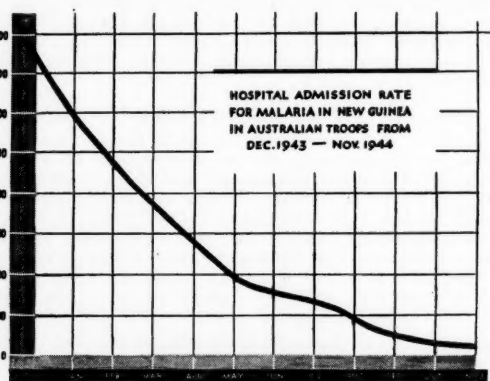


FIGURE I.

typhus and bacillary dysentery. Malaria became a powerful weapon in our hands, once we had controlled it and the enemy had not. Its value became greater than Bren guns or 25-pounders. The fall in incidence of malaria in Australian troops in New Guinea is well shown graphically in Figure I; an enlarged version of this graph hangs in the Wellcome Medical Museum in London.

An equally great step forward was made by the Royal Army Medical Corps in France in 1944. Brilliant use of the most careful research on insecticides and vaccines resulted in the total disappearance of typhus fever from British, Canadian and American troops in Europe despite a severe winter. Impregnation of all shirts with DDT combined with a good laundry service was sufficient to keep off the louse. In Naples an outbreak of typhus fever amongst the civil population was quickly controlled with DDT powder.

The duties of the modern medical corps cover every aspect of the soldier's life from the moment he enters

<sup>1</sup> E. L. Spears, Brigadier-General: "Liaison, 1914."

The Director of Army Medical Services held monthly conferences which were attended by his chiefs of directorates, his consultants, the Directors-General of the Navy and Air Force, representatives from the Ministries of Health, Supply and Production and from the Emergency Medical Service, directors of medical services of forces abroad who were home on duty, and representatives from the Dominions and the Allies. These meetings disclosed a formidable array of red tabs, but were short and admirably controlled by the Director-General of Army Medical Services. Everybody present was kept informed of medical developments in all theatres of war in which British troops were engaged.

The Medical Research Council under the auspices of the Privy Council greatly extended its activities and collected men from the services and civil life to form committees on specific subjects which were of immediate and paramount importance. These committees were relatively small, and they directed and controlled research teams as required. Medical liaison officers of the Dominions were privileged to attend such committees in which their country had a particular interest, either as members or as listeners. When necessary, physiologists, biochemists, malarologists, entomologists, pathologists, *et cetera*, served on committees together. The three services were always represented.

Insecticides became of such importance that special panels were appointed to deal with this side—the Insecticide Developmental Panel and the Insecticide Applications Committee. Dominion medical liaison officers also had close contact with other services, with research organizations such as the Transfusion Service (Bristol), the Lister Institute, the Wellcome Research Foundation, the Imperial Chemical Industries Biological Research Centre (Manchester), the Schools of Tropical Medicine in London and Liverpool (both of which have Australian professors), the Ministry of Health and its various departments, and with the Directors-General of the Royal Navy and the Royal Air Force.

The dissemination of purely medical knowledge was the function of the Royal Society of Medicine with its special sections, and of the Royal Colleges of Physicians and Surgeons. The Royal Society of Medicine held special monthly meetings dealing specifically with war medicine, to which only medical members of British, Dominion and Allied services were admitted. No notes were kept of these meetings until towards the end of the war.

The War Office had special committees dealing with chemical and bacteriological warfare, and some Dominion medical liaison officers were members of these committees.

#### *Australian Medical Supplies.*

The London representative at Australia House dealing with medical supplies required from the United Kingdom by Australia received annually from the Division of Import Procurement the Australian programme of requirements for the ensuing year. This programme had previously been scrutinized by the Medical Equipment Control Committee in Australia and was accepted as a true statement of Australian vital requirements by the United Kingdom Directorate of Medical Supplies.

When the approval of the Director of Medical Supplies (United Kingdom) was obtained, the Division of Import Procurement was advised by cable and United Kingdom suppliers and shippers were advised that their orders were sponsored. The medical liaison officer came into the supply problem when there was any doubt as to the amount of a commodity required or as to the reason for a specific request for a substance in short supply. He could usually obtain the answer quickly by cable, and as he knew the future commitments of the Australian medical services, his influence could carry considerable weight in allocation and delivery.

Certain commodities such as penicillin and insecticides were pooled by Britain and the United States of America and allocated by a special Assignment Board—allocation being based on specific requirements and future commit-

ments. The medical liaison officer attended meetings of this Assignment Board and acted as spokesman for his Director-General of Medical Services.

#### **Part III.**

#### *Work of the Australian Army Staff in the United Kingdom with Particular Reference to the Medical Liaison Officer.*

The Australian Army Staff in the United Kingdom consisted of an Australian Army Representative with the rank of Lieutenant-General, a Deputy Australian Army Representative and staff, and a number of liaison officers, technical and otherwise. At the peak of activities there were over 70 officers on the permanent staff in addition to several visiting representatives.

With the object of keeping in touch with medical developments in Allied countries, the Director-General of Medical Services, Australian Military Forces, established a medical liaison officer on the Australian Army Staff in London in 1940. Lieutenant-Colonel W. Trethowan held the appointment for a short time, and when he went to the Middle East he was succeeded by Colonel J. H. Anderson, C.M.G., C.B.E. In time to come Colonel Anderson may well be known as "the father of Australian medical liaison". The organization he developed and the information he supplied in a constant stream are known only to those who had the privilege of working with him. His admission last year as a Fellow of the Royal Australian College of Physicians was a source of great satisfaction to his many friends.

The London liaison proved of great value and led to the establishment of a similar post in Washington in 1944. I had the privilege of serving as a medical liaison officer from "D Day", 1944, until the end of the war, when I was succeeded by Lieutenant-Colonel A. Sharp. On my arrival in England there were medical liaison officers from the United States (attached to the United States Embassy), from Canada, from Australia, from New Zealand, from South Africa, from France, from Belgium, from the Netherlands and from Norway.

#### *Duties of a Medical Liaison Officer in London.*

The Staff College, Camberley, in a précis to students, gives the following as the main function of a liaison officer: "To keep his commander and formations supplied with the latest information." The medical liaison officer should be the ears and eyes of his Director-General of Medical Services, keeping him in touch with trends of development in those fields of medical science which have a bearing on war, and which may help the medical directorate to improve the army's efficiency, to reduce wastage and to keep up morale.

The medical liaison officer is the direct link between his own Director-General of Medical Services and the Director-General of Army Medical Services at the War Office. He is his direct representative, and as such should speak with authority. He should not give his own personal opinion to the War Office (unless it is especially asked for), but should always know or ascertain the views of his own directorate on any particular subject and be its mouthpiece. He should always be honest and accurate in his statements, and not be afraid to say "I do not know", as a cable will bring the desired information quickly.

Contact should be established also with medical directorates of the Royal Navy and the Royal Air Force, as information of great value will be forthcoming from time to time from these sources.

Personal contact should be extended gradually as the medical liaison officer grows accustomed to his surroundings. He should be a member of those committees of the Medical Research Council in which his country has a particular interest. He should become a regular attendant at medical society lectures and discussions and visit teaching hospitals whenever time permits. He should make periodical visits to research institutions and talk to workers in different fields of study. He should keep in touch with the Ministries of Supply and Health and with



the Colonial Office, and be in close contact with his fellow medical liaison officers from the other Dominions and the United States of America. It is also advantageous to maintain close contact with his own country's medical liaison officers wherever they may be stationed. In this way he will be kept informed of advances made by our Allies.

The medical liaison officer has to establish sympathetic liaison with the members of the military staff to which he is attached, as in the course of their routine duties these officers will obtain much information which is of interest to him, such as the formation of special units, new equipment, clothing, packing, *et cetera*.

It is essential for the medical liaison officer to be on the distribution list for Army Medical Directorate publications, books and pamphlets, and a weekly visit to His Majesty's Stationery Office will pay dividends.

It is most important that liaison should be two-way. The medical liaison officer should be adequately kept posted with copies of all army medical publications from his own service, with reports for the Director-General's consultants and subordinates, and with original articles from individual medical officers. It is of great value to be able to give as well as to receive information and keep the War Office abreast of any advance in medicine in one's own country.

The liaison officer must appreciate the fact that his job is to obtain information for transmission to his parent directorate and not merely to acquire knowledge for himself. He therefore must attempt to cover a general field, as opposed to becoming an expert in any particular branch.

Personal contact is the secret of good liaison, and letter writing and telephone conversations are poor substitutes. The more he is out of his office, within reason, the greater is his use and the more information he will get. It is necessary therefore that he should have a well appointed office and competent clerical staff to deal with incoming messages when he is out. Casual callers are apt to judge the importance attached to an appointment by the way in which the authorities house the man holding it.

It may fall to the lot of the liaison officer to be concerned in the obtaining of medical supplies. When he is placing bids for particular commodities in short supply, it is of the utmost importance that he should be clearly informed as to the purpose for which the stores are required, and the medical liaison officer must be completely honest in this matter and so have the confidence of his colleagues.

Unless he absorbs the spirit of the country in which he is living and on which he is reporting, he loses much of significance and interest. Therefore, he should study and report, in general terms, on the politics of the country and on any possible bearing politics may have on medicine. He also should study local customs and habits and mingle with the people to know what they are thinking. He should also interest himself in their culture, art, music and theatre, whenever opportunity permits.

In the United Kingdom the Dominions were well represented by medical men of the highest calibre. The medical liaison officer can be greatly assisted if he can rely on their support. In this regard we have been most fortunate in having Sir Thomas Dunhill as Honorary Consulting Surgeon and Dr. C. H. Kellaway as Honorary Consulting Physiologist to the Australian Army Staff.

The medical liaison officer communicates with his director-general by means of demi-official letters. These should be fairly frequent—about one per fortnight—and should contain matters of general interest. They should represent his own summing up of the trend of thought and events, and should cover subjects in a short pithy way, without much detail.

Detailed reports on subjects, important official documents, pamphlets, notes of lectures and committee meetings are sent direct as soon as prepared. Urgent inquiries are dispatched by cable.

The medical liaison officer should be given the privilege of writing direct to his director-general. This means a

great saving in time. His demi-official letters should be seen by the General Officer Commanding the staff on which he is a member before their dispatch, and of course the medical liaison officer will keep the other members of the staff informed on medical matters which have a general interest.

#### *Qualifications of a Medical Liaison Officer.*

The qualifications of a medical liaison officer are aptly summed up by the Staff College, Camberley, as follows:

A liaison officer must be capable of gaining and justifying the confidence and trust of his Commander and others. He must keep up to date and know what is in his Commander's mind. This requires a receptive mind and the ability to sift the information he receives. He must have an eye for country and the trend to develop a photographic mind. In short, he should possess personality, intelligence, tact and inquisitiveness.

"Field Service Regulations", Volume II, states:

Liaison Officers must be specially trained men on whose judgement and knowledge a Commander can rely.

In the words of Field Marshal Viscount Montgomery:

This is skilled work of great importance and first class officers are required for it. . . . They must have an attractive personality which will make them welcomed by commanders in all grades; they must have character that will enable them to obtain their information without creating suspicion at any level.

#### **Part IV. A Medical Liaison Officer in Peacetime.**

Since the end of hostilities the duties of the medical liaison officer have shifted gradually from a military to a civil function. The contacts with leading medical men built up during the war are being turned to good account in the finding of suitable employment and in the post-graduate training of young Australian medical graduates eager to extend their knowledge of medicine and surgery. At a time when competition is keen and opportunity for instruction limited, the medical liaison officer has proved of untold value in obtaining places in courses for Fellow of the Royal College of Surgeons and Member of the Royal College of Physicians candidates and in securing accommodation and assistance.

Sir Francis Fraser, Dean of the British Post-graduate Medical Federation, the central control body for post-graduate instruction in London, has emphasized the value of Dominion representatives who can vouch for applicants for post-graduate training and bring to his notice the type of training required. Further, he can budget ahead if he knows the likely number and quality of Australian graduates intending to proceed abroad, and reservations can be made for them before they leave Australian shores. Likewise the Nuffield Foundation, which has generously allotted fellowships to Australian graduates, has freely used the services of the medical liaison officer in the placing of selected Fellows and in their welfare.

The Fellowship of Medicine, the Royal Society of Medicine and the Royal Colleges of Physicians and Surgeons have become used to obtaining information through the medical liaison officer who has been in a position to supply their requests.

Unfortunately the military medical liaison officer in London will shortly cease to exist. It is believed by many of us who have been concerned with this type of work during the war, that a permanent civil medical liaison officer in London could greatly help medical practice in Australia and be of inestimable assistance to young graduates who travel to enrich and widen their general and medical experience. There is need too for a central body in Australia to coordinate undergraduate and post-graduate training in the widest possible sense.

One would envisage the peace-time medical liaison officer as a civilian, the representative of a central medical authority in Australia and responsible direct to that authority. Medical graduates visiting the United Kingdom would go accredited with letters of introduction, and the medical liaison officer would be notified beforehand of

their arrival and of the type of work they wished to do. The medical liaison officer would have a close liaison with the Dean of the British Post-graduate Medical Federation in London and with post-graduate schools in Scotland, Ireland and the provinces, and could find places for these men on their arrival and assist them generally. This would replace the pre-war haphazard method by which a graduate on his own initiative found his way over to the United Kingdom, but usually spent some depressing months in London before finding his feet.

The medical liaison officer would be of assistance to those British medical men who wished to learn details of medical practice in Australia with a view to migration or teaching appointments, and he could put men working on similar lines in both countries in touch with each other with mutual benefit.

Further, his interests could perhaps extend beyond medicine to dentistry, to the nursing services, to physical therapy, to radiography, to occupational therapy, *et cetera*—in short, he could be an accurate and imaginative reporter on any profession or subject that is linked with the art and science of medicine.

#### Acknowledgements.

I should like to thank Major-General S. R. Burston, C.B., C.B.E., D.S.O., for permission to publish this article. I should also like to pay a tribute to Colonel J. H. Anderson, C.M.G., C.B.E., who taught me everything I know about medical liaison.

#### THE DIAGNOSIS OF HYSTERICAL CONVULSIONS.

By D. CAPPON, M.B., B.S. (London),

Captain, Royal Army Medical Corps; Officer in Charge, Psychiatric Wing, British Military Hospital, Poona, India.

In perusing case records of patients eventually "boarded" out of the service with a diagnosis of "hysteria, motor convulsions", one often sees that both the physician and the psychiatrist were in doubt as to whether the condition was epilepsy or hysteria. After a varying period of observation in hospital, unless the patient had definite epileptic seizures, he may be regarded as hysterical and disposed of accordingly. Should the patient then turn out to be a true epileptic, it is important to realize that not only injury (organic trauma) may result, but psychological trauma also. The patient may have received superficial psychotherapy with the reassurance that once his mental conflict is solved the seizures will not recur. The psychosomatic disturbance of epilepsy may then be palliated, and the patient may actually improve until one day he has another seizure. His confidence vanishes, together with whatever plans he made for himself, and he slumps into depression. Now neither the physician nor the psychiatrist will find him an easy patient to convince, for he is distrustful and possibly even negativistic.

In the absence of facilities for electroencephalography, the pitressin hydration test may be found useful.

The following is an illustrative case.

#### Report of a Case.

Sergeant G.Y., a regular soldier, aged nineteen and a half years, was admitted to hospital for evacuation to the United Kingdom, having been medically boarded with a diagnosis of motor hysteria. On his admission to hospital he had no complaints, but wanted something done about his seizures because he was afraid they might ruin his life. The seizures had started at the age of eighteen and a half years one night when he was in bed; he remembers only waking up in hospital on the following afternoon, though the actual seizure lasted for ten minutes. Two of his non-commissioned officer friends witnessed this seizure. Here it must be noted that he was stationed in a very hot part of India at the time; but he was happy in the job and undisturbed by heat. After a period of six days' observation, during which he had no seizures, he was discharged. Twenty days later, while handing over his duty one night, he had another seizure,

again in the presence of his two friends. This time he was kept in hospital for twenty-five days, during which period he had several seizures. A medical officer described one seizure as follows: "Foaming, screaming and struggling; no injury, no incontinence. Had premonition of fit by dizziness. Fit was mainly muscular spasm and there was a period of excitement following it. After seizure there was complete amnesia, weakness and left frontal headache." The psychiatrist noted the following points: "Has been hospitalized on three occasions on account of fits; these fits have been observed in hospital and are strongly suggestive of hysteria." These attacks lasted about ten minutes; they always occurred in the presence of other persons, and the patient never seriously harmed himself nor exhibited incontinence. The number of seizures prior to his admission to this hospital was about 24. He did not have an attack for ten days while under observation in this hospital.

Investigation of the family history gave the following information. A brother was discharged from the Royal Air Force with "confirmed epilepsy". The patient has never seen him in a seizure. One sister is very nervous and two other siblings are alive and well. The mother has "hysterical fits"; the patient has seen only one when aged twelve years and "never wants to see one again". The father is a cruel man and left the home when the patient was aged fifteen years (possibly he is psychopathic). The children were separated and brought up in a Poor Law institution. The patient's childhood was spent in poor surroundings, he never had a decent home, and was never happy as a child. He was under strict discipline at school where he developed "nervousness". He remembers a few neurotic traits: as a child he "could not stop laughing and had to be locked up in a room". In civilian life he had worked steadily for four years as a clerk and then volunteered for the army. He did not need to make an effort to adjust himself to service life, as he was already "used to discipline from school". He was quite happy, and was quickly promoted in India. As a regular soldier he was content to make soldiering his career. Until the seizures started he was efficient; but after that his efficiency deteriorated and he had to have forty days off duty.

With regard to his emotional growth he had no sexual interest. He was very attached to his mother, "being the only child who stuck to her". He had sustained no head injury, and no relevant abnormality was revealed by the history of his past illnesses.

On physical examination of the patient, no abnormality was detected except for signs of sympathetic system disturbance due to anxiety—mild tremors, sweating, tachycardia when he was excited (pulse rate of 90 per minute), hot flushes. X-ray examination of the skull and muscles revealed no cysts and no sign of past injury. Examination of the patient's mentality was undertaken. In behaviour he was fidgety, but otherwise normal. He was emotionally unstable and immature (he burst into tears during a simple interview). In personality he was sensitive, shy, not integrated. He would be deeply concerned at the least adverse comment from a superior. His intellectual functions were good; his intelligence was rated as "S.G. II" (matrix score, 49 in 40 minutes); insight was present. He was said to have shown indifference to his seizures, but fear of epilepsy. That was not his reaction at the time of examination; he was developing a true anxiety state.

It was decided to give him the pitressin hydration test to elucidate the diagnosis. The patient was confined to bed and given a normal diet. His urine was tested for albumin and sugar and found to be normal. Hypertension, myocardial insufficiency, diabetes and kidney disease were excluded on reexamination. Thus, in the absence of contraindications, the test was carried out as follows. An initial dose of 0.50 millilitre of a pitressin preparation was given intramuscularly, with 300 millilitres of water orally and subsequently two-hourly intramuscular injections of pitressin of 0.25 millilitre each, followed by 300 millilitres of water. A total of ten injections was given. An intake and output chart showed the antidiuretic effect with retention of water. The body weight was increased by 2%. After the fifth injection (a total of 1.50 millilitres of pitressin and 1,500 millilitres of extra water, 2,300 millilitres total fluid intake and 600 millilitres output), the patient had an epileptiform convulsive seizure. He became dizzy (aura) and later confused and incoherent, and then lost consciousness. He exhibited jactitations and later tonic and clonic convulsions of the hands and oculo-ocular convulsions; his pupils were dilated, his pulse rate was 82 per minute, and his respirations numbered 28 per minute. He had a similar attack during the early hours of the morning after the tenth injection, twenty-four hours after the beginning of the test (a total of 2.75 millilitres of pitressin, 3,000 millilitres of extra water, 6,000 millilitres total intake of fluid, and 3,900 millilitres total

output). Unfortunately, as no medical officer was present during these attacks, neurological examination was not carried out. The two reports of the day and night charges of the ward (experienced male nursing orderlies) tallied. They thought the seizures were not imitable and that they were genuine epileptic attacks. Before evacuation the patient was observed by the medical officer in a spontaneous seizure, which confirmed the epileptic nature of the convulsions.

The patient was told of his condition and how it could be controlled. Superficial psychotherapy was reorientated and applied together with a short period of sedation. The patient became more cheerful and confident, because he knew where he stood, and was prepared to cope with his handicap. He also realized that his mental condition might well precipitate the attacks. The anxiety state lifted.

#### Discussion.

The case described fulfilled most of the clinical criteria of hysterical fits: (i) a poor psychiatric background, (ii) a psychopathic personality, (iii) the witnessing of seizures previously, (iv) the occurrence of seizures always in the presence of other persons, (v) absence of injury during the fit, (vi) absence of incontinence, (vii) atypical convulsions which can usually be imitated and (viii) the onset of the seizures fairly late in adolescence. The characteristics are described in that order to emphasize the positive psychiatric criteria first. And yet there were enough points to render the diagnosis doubtful: the presence of an aura, positive findings in the family history and the absence of any apparent psychological gain. The patient was not a typically extroverted hysterical type; he was intelligent and willing to use insight. The pitressin hydration test, a slight modification of that described by Blyth (1943), gave a positive result. This discredited the previous diagnosis and suggested a primary diagnosis of idiopathic epilepsy (latent). In this connexion it is worth while remembering that there is a psychic form of epilepsy in which convulsions are not usually present, and the psychiatric symptoms (from irritability to attacks of mania *et cetera*) predominate. Moreover, if an epileptic subject happens to be hysteroid, he may easily make use of his symptoms. Thus the differential diagnosis between the two conditions under discussion can be most difficult. It must be stressed that a psychiatric diagnosis should be made only on psychiatric grounds, and not, as it is often made, by exclusion of organic disease. Furthermore, in L. Alexander's words (1944): "The diagnosis of hysteria should only be accepted upon completion of the cure of the presenting conversion symptoms. . . . Hysteria is a working hypothesis valid only for a limited time (e.g., prior to treatment)." While the pitressin hydration test is of little value when the result is negative, when it is positive and a convulsive seizure is observed (in a patient hitherto not having been seen in a seizure) the diagnosis becomes almost certain. As a word of warning it should be added that the test is not devoid of danger (for example, *status epilepticus* and post-convulsive palsy), and adequate precautions are therefore necessary.

#### Summary.

A case with a doubtful diagnosis of hysteria (motor) has been described. The pitressin hydration test proved the diagnosis to be idiopathic epilepsy; accordingly, the patient was treated successfully.

The pitressin hydration test has been described and the differential diagnosis between hysteria and epilepsy discussed.

#### Acknowledgements.

I have to thank Lieutenant-General T. O. Thompson, Director of Medical Services in India, and Colonel P. E. D. Pank, officer commanding the British Military Hospital, Poona, for permission to publish this article, and Lieutenant-Colonel T. A. Munro, Adviser in Psychiatry in India, for encouragement and valuable help.

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## Reports of Cases.

### ACUTE HÆMORRHAGIC NECROSIS OF THE PANCREAS, WITH ACUTE INTESTINAL OBSTRUCTION, FOLLOWED BY RECOVERY.

By J. DE VIDAS, M.B., B.S., D.T.M., M.R.A.C.P.,  
Alice Springs.

THE explanations given of the cause of acute hæmorrhagic necrosis of the pancreas (acute pancreatitis) are legion. One is accordingly forced to believe that multiple ætiological factors exist, or that the exact cause of the disease is still unknown. In some way, pancreatic enzymes are liberated from the pancreatic ducts and acini; trypsinogen is activated to trypsin, which digests pancreatic tissue and erodes blood vessels, the result being pancreatic necrosis and an outpouring of blood and inflammatory exudate; lipase splits fatty tissue into fatty acids and glycerine with subsequent fat necrosis.

Other things being equal, the severity of the disease would seem to be proportionate to the amount of enzyme liberation and pancreatic necrosis. In my experience the illness may vary from a mild pancreatic lesion with some red blood cells and inflammatory exudate in the celomic cavity followed by recovery, through an intermediate stage progressing to recovery or death, to a widespread fatal fulminating lesion. The clinical picture will correspondingly vary from one of acute abdominal discomfort, digestive disturbance and a high diastatic index, to an acute abdominal emergency with shock, toxæmia, pancreatic death and body death.

The events to be described in this case follow an orderly pathological sequence of injury, inflammation, resolution and organization. However, although the pancreas may be the focus of disorder, the disturbance is radiated to other structures in physiological and anatomical relationship to it, so that the reactions to the lesion add their own complement of distress. Not only is pancreatic function disturbed, but also there may be (as in this case) an acute abdominal emergency with ileus, peritoneal involvement and acute intestinal obstruction, and their attendant biochemical disorder of body tissues.

#### Clinical Record.

The patient, W.J.D., an obese railway guard, aged thirty-nine years, was admitted to the Alice Springs Hospital in obvious distress about nine hours after the onset of severe abdominal pain, which had begun at midnight on July 6, 1946. The pain was situated in the middle and lower parts of the abdomen; it fluctuated in intensity, but did not radiate or disappear. A white slimy fluid had been vomited three times before he was examined. The abdomen had swelled, and the patient had passed neither *fæces* nor *flatus*. Three similar attacks of the same pain had occurred in the last six months, but they were not so severe, and had subsided in a few days. About three years before the patient had contracted catarrhal jaundice, from which he had made an uneventful recovery.

On inspection, the abdomen was slightly distended and moved with respiration. On palpation, the abdominal wall was found to be rigid and tender in the right upper quadrant; slight muscle guarding was present elsewhere; no mass or free fluid was discovered. The abdomen was "silent" on auscultation. No icterus was present. The blood pressure was 130 millimetres of mercury, systolic, and 95 millimetres of mercury, diastolic. The pulse rate was 106 per minute, and the temperature was 96° F. The urine was clear. All other systems were normal on clinical examination. A two-enema test produced *fæces* and *flatus* in the first enema, and *flatus* and a few *fæcal* flecks in the second.

The clinical picture was that of an abdominal crisis, not referred from any extraabdominal system such as the



heart, lungs or central nervous system. At the same time it was one of an atypical acute abdominal emergency. There was no definite pointer in the history or examination towards a perforated viscus or an obstructed bowel as the cause. A tentative diagnosis of acute hæmorrhagic pancreatitis or tuberculous peritonitis was made, and it was decided to treat the patient conservatively by supportive measures for the time.

After the patient's admission to hospital, his condition improved. The abdominal rigidity was less and only a localized area of tenderness and muscle guarding remained over the right upper quadrant. On July 8 he vomited on two occasions small amounts of dark red granular fluid and passed much flatus, with relief. He was drinking plenty of fluid without pain and felt much better. The pulse rate was 110 per minute and the hæmoglobin value 100% (Sahli). On July 12 he began to vomit large amounts of brown, offensive fluid, and the abdomen became greatly distended. The intravenous drip administration of 5% glucose in saline solution and duodenal suction were started. Examination of the urine revealed albumin and diacetic acid. On July 14 the duodenal suction apparatus was returning clear fluid from the small intestine, the vomiting and distension were less, and the patient was taking food as well as fluids by mouth.

While the ileus was subsiding, the temperature was rising and signs of consolidation appeared at the base of the left lung. A course of sulphamerazine and penicillin treatment was instituted.

On July 20 the abdominal distension had become minimal, and the patient was eating well. At the same time, he was frequently passing stools consisting of a dark brownish-yellow, foamy, offensive fluid. Although he felt comfortable and the abdominal signs had almost disappeared, on August 6 the patient appeared to be far from well. Fluid was present in the left pleural cavity, consisting of fibrinous exudate and a few lymphocytes, and fluid was also present in the abdomen. His face was flushed and he had a "hectic" temperature. It was felt that one could only adopt an expectant attitude with chemotherapeutic and supportive measures in the hope that the abdominal and lung lesions would eventually resolve. On August 15 definite signs of acute intestinal obstruction appeared, with generalized colicky pain, abdominal distension, constipation and a quick decline in the patient's condition. An X-ray picture taken with the patient in the sitting position showed fluid levels.

On August 15 the abdomen was opened through a right lower paramedian incision under "heavy" spinal anaesthesia. Free fluid was present in the abdomen; it was sero-fibrinous, and about three large fibrin clots were present in the abdominal cavity. These were removed. In addition, filmy and tough fibrinous adhesions of recent origin were present among coils of gut. Two of these bands were compressing the ileum, which was ballooned above and collapsed below. The peritoneum and mesenteric fat and appendices epiploicae were studded with yellow-white nodules of fat necrosis, the presence of which was later confirmed by histological section. The small intestine was congested. The obstruction was relieved by division of the adhesions and the abdominal wound was closed without drainage.

On August 17 the patient's condition was much improved. No abdominal distension, vomiting or pain was present, and he was eating and drinking well. But for the fluid in the left pleural cavity, the patient showed no signs or symptoms. The abdominal wall healed by first intention, and the patient began to make a steady recovery and put on weight. On September 2 he had put on weight and was feeling very well. Fluid was still present in the left pleural cavity, and at his own request the patient asked to be transferred by rail to his home town in Port Augusta. Some weeks afterwards he wrote to state that he was completely well.

#### Summary and Conclusions.

1. A case is described of acute hæmorrhagic necrosis of the pancreas complicated by intestinal obstruction caused by peritoneal bands formed from organized peritoneal exudate, with recovery.

2. The illness was possibly the culmination of previous minor pancreatic disturbances.

3. Non-surgical treatment was adequate for the pancreatic lesion and the accompanying paralytic ileus.

4. The process of repair through resolution and organization was attended by a further complication in the form of acute intestinal obstruction caused by organization of peritoneal exudate into bands. Although the peritoneal reaction was designed biologically to be protective, it would have in the end proved fatal but for surgical intervention.

#### Acknowledgement.

My thanks are due to the Director-General of Health, Commonwealth Department of Health, Canberra, Australian Capital Territory, for permission to publish this case.

#### EPITHELIAL PLAQUE OF THE CONJUNCTIVA.

By R. HERTZBERG,  
Sydney.

DUKE-ELDER<sup>(1)</sup> describes cornification of the conjunctival epithelium as a rare pathological change which occurs in various forms. Changes similar to xerosis take place rarely in small areas of epithelium, and have been described variously as epithelial plaques, tygomata, cornification of the conjunctiva, keratosis of conjunctiva and conjunctival callosities.

#### Clinical Record.

A man, aged 31 years, consulted me on February 24, 1947, complaining of a lump on his right eye. He had first noticed the lump about four weeks previously, and he did not think that it had changed in size in the last two weeks. He lived in Townsville, north Queensland, where he worked among horses. On examination of the patient, visual acuity was  $\frac{1}{20}$  in the right eye and  $\frac{1}{10}$  in the left eye. Visual acuity in the right eye was  $\frac{1}{10}$  with correction by a cylinder of +1.25 diopters on an axis of 100°. On the conjunctiva of the right eye opposite the 3 o'clock position and about three millimetres from the limbus was a small, raised, greyish-white mass about four millimetres in diameter, which had a finely pitted surface. It was freely mobile, and apart from a leash of vessels passing up to its medial aspect there was no evidence of inflammatory reaction. The remainder of the conjunctiva, both bulbar and palpebral, was normal. Examination of the media and fundi revealed no abnormality. The mass was excised together with healthy conjunctiva on all sides on March 5. It was submitted for histological examination, and was reported on as follows:

There is an abrupt transition from the conjunctival epithelium to a much thickened epithelium consisting chiefly of a prickly cell layer of abnormal character.

In many parts the cells of this layer are separated, probably as a result of dilatation of the lymph spaces (spongiosis), and here the intercellular fibrils are particularly well marked. Mitotic figures are present in occasional cells (acanthosis). Numerous thin walled vessels are also to be seen in this layer and a few inflammatory cells of the lymphocyte class are scattered throughout.

The horny layer is represented by a narrow zone of cells with flattened nuclei (parakeratosis).

The basal layer shows no papillary processes, and the underlying connective tissue contains numerous small round cells resembling lymphocytes and plasma cells, suggestive of a mild inflammatory reaction.

The condition appears to be benign and may be regarded as an epithelial plaque of the conjunctiva.

#### Discussion.

Duke-Elder<sup>(1)</sup> states that epithelial plaques are characterized by a thickening and keratinization of the epithelium with the deposition in the cells of kerato-hyalin, and by a tendency towards the development of papillary

processes invading the subepithelial tissues, and towards the occurrence of degenerative changes of a hyaline or amyloid nature in the submucosa. Collins and Mayou<sup>(2)</sup> define the condition as a localized hyperplasia of the surface epithelium appearing as a sharply defined white or yellowish patch a few millimetres in diameter with a dull granular surface. The epithelium is found to have assumed the characters of the skin, and to possess surface layers containing keratin, kerato-hyalin and prickle cells.

Two cases are described by Parsons;<sup>(3)</sup> both patients were young subjects. In each case the epithelium was thickened and the superficial layers were corneous. Parsons regarded the plaques as the simplest expression of a dermoid tumour, only the epidermal elements being represented, those of the *cutis vera* being absent.

The aetiology of the condition is in dispute; exposure may be of importance, as these plaques usually occur in the palpebral aperture. However, Collins and Mayou<sup>(2)</sup> do not regard exposure as a significant aetiological factor, as the plaques may occur when no undue exposure has occurred.

The condition is benign; but recurrence has been reported after X-ray treatment<sup>(4)</sup> or after scraping<sup>(5)</sup> and cauterization.

#### Summary.

A case of an epithelial plaque of the bulbar conjunctiva is described.

The condition is non-malignant and is of rare occurrence.

#### Acknowledgement.

I wish to thank Dr. C. B. Cox for his kindness in reporting on the section.

#### References.

- <sup>(1)</sup> S. Duke-Elder: "Textbook of Ophthalmology", Volume II, page 1762.
- <sup>(2)</sup> Collins and Mayou: "Pathology and Bacteriology of the Eye", Second Edition, page 166.
- <sup>(3)</sup> J. H. Parsons: "Pathology of the Eye", Volume I, page 130.
- <sup>(4)</sup> A. Wollenberg: "Ein neuer Fall von Bindehautschwielen", *Klinische Monatsblätter für Augenheilkunde* (Beilage), Volume LXXVIII, 1927, page 135; quoted by S. Duke-Elder, *loc. cit.*
- <sup>(5)</sup> Jacqueau and Bujadoux: *Bulletins de la Société française d'ophtalmologie*, Volume XXXVII, 1924, page 329; quoted by S. Duke-Elder, *loc. cit.*, page 1764.

#### SUBMAXILLARY CALCULUS: SPONTANEOUS CURE.

By THOMAS J. RITCHIE,

North Bondi, New South Wales.

NINE years ago Mr. C., aged forty years, noticed slight pain and swelling of the submaxillary gland while eating. Eighteen months afterwards he had a severe attack of inflammation of the gland which ended in suppuration. After several days the duct formed a false passage, and there was a discharge of pus and blood. Two small calculi the size of wheat grains were discharged. Dr. C. Winston explored the duct through the false passage, but found no further calculi and suggested an X-ray examination; but the patient did not go on with this. Thenceforward the patient had mild attacks of inflammation, but no further abscess formation. These attacks were accompanied by soreness and inflammation of the duct and appeared to be precipitated by colds. In March, 1946, I was consulted by Mr. C., on account of an attack of acute left submaxillary adenitis. This subsided with a course of sulphadiazine, and an X-ray picture then disclosed a large calculus in the gland. He was advised to undergo a radical removal of the gland, but refused.

Mr. C. had an attack of renal colic at a later date, and an excretion pyelogram revealed bilateral renal calculi. For this he has been treated at Sydney Hospital by Dr. A. Teller. The stones which the patient has passed consisted mainly of calcium salts of oxalic and carbonic acids and of triple phosphate.

The patient has the habit of rubbing the gums with the fingers smeared in toothpaste before retiring, and on the night of May 9, 1947, he felt a roughening of the back of his mouth on the left side. He consulted me. On examination, I found an ulcerated patch in area about two-thirds of an inch by one-third of an inch between the angle of the jaw and the base of the tongue. The base of the ulcer was obviously the calculus. I probed it and as it appeared somewhat loose I endeavoured to seize it with a pair of Luc's forceps. After a few attempts, in which I broke off a few pieces of the calculus, I gripped it, and drawing it downwards and forwards, extracted it quite easily. A little pus was present which smelt evilly. The calculus left a large pocket which has steadily closed up. The calculus measures one and a quarter inches by one inch by seven-eighths of an inch and is of a roughly pyramidal shape. It is grey in colour and the surface is roughened.

## Reviews.

### ANATOMY FOR NURSES.

DR. E. B. JAMIESON has produced a second edition of "Illustrations of Anatomy for Nurses", the first edition of which was produced in 1938.<sup>1</sup> Owing to the shortage of materials and labour, it has been out of print for a considerable time. It has altered its form, and now appears in a loose-leaf binding with the illustrations printed on both sides of the page.

In this edition one new picture (the deep parts of the sole of the foot) has been added, and an index has been provided giving the numbers of the plates in which the different structures are shown. Numerous other minor changes have been made, especially in the colour scheme of many of the illustrations.

As the plates are a selection from the author's book for students and practitioners ("Illustrations of Regional Anatomy"), no further comments are necessary. They will be useful to nurses as long as the nurses realize that they are only diagrams, and that such multi-coloured structures will not be seen anywhere in the body.

### PSYCHOLOGY FOR NURSES.

DR. BESS V. CUNNINGHAM is to be congratulated on her "Psychology for Nurses", a book written and designed for student nurses.<sup>2</sup> The author, as Professor of Education at the University of Toledo, Ohio, lectures to the student nurses of five hospitals, and gives us the benefit of a long experience. Whilst the specialized approach to psychology has many merits, the reader feels that much of the information would be useful to students of other branches of the medical profession, including medical students. The standard of knowledge is high, the book is well documented, and if it is much used in the land of its origin, indicates a high educational status in the nursing profession. In conformity with the American zest for specialized learning, each chapter has an excellent summary and instructions in group investigation on the student level by the students themselves.

Dr. Cunningham wisely refrains from any extensive reference to nervous disease, and she is content to deal with the application of psychological principles in work and life. A chapter on "Learning How to Study" gives interesting analyses of time wasting and aids to learning. In pleading for the student's intensive search for meanings, the author quotes a class exposition on the poem commencing with the following lines:

The stag at eve had drunk his fill  
Where danced the moon on Monan's rill.

One student, when asked what a stag was, answered: "A stag is—is when a fellow hasn't got a girl." "Monan's rill"

<sup>1</sup> "Illustrations of Anatomy for Nurses", by E. B. Jamieson, M.D.; Second Edition; 1946. Edinburgh: E. and S. Livingstone, Limited. 8½" x 6½", pp. 12, with 64 coloured plates. Price: 8s. 6d. net.

<sup>2</sup> "Psychology for Nurses: Designed and Written for Student Nurses", by Bess V. Cunningham, Ph.D.; 1946. New York, London: D. Appleton-Century Company, Incorporated. 8½" x 5½", pp. 356, with illustrations.

may have been "Monan's Grill". Anecdotes and quotations are interspersed through the book and make for pleasant reading.

The approach to "Psychology for Nurses" is largely through child psychology. This is well discussed, and is illustrated by excellent photographs. Whilst such a plan has the merit of intrinsic soundness, for the student nurse it has an additional advantage. In her career she will have many child patients and adult patients with children. Child psychology for both physician and nurse should be a basic study. Furthermore, to her as a wife, citizen and member of a community, adult and child psychology has a valuable message in the realm of mental hygiene.

The relationship between bodily and mental processes receives due consideration; the individual is regarded as a whole, so that "the total situation to which we respond at any one time depends upon many factors such as physical condition, previous experiences with similar situations, immediate interests and immediately preceding activities". As an example of the practical approach to nursing problems may be quoted a summary dealing with outbursts of temper. "The human organism is so constructed that release from tension may be obtained through vigorous expression. The problem of the nurse in guiding angry and irritable behaviour is to find ways of providing the patient with an outlet. She can also help by trying to discover why he is frustrated."

"Psychology for Nurses" should be in every library for nurses. It will be read with interest and profit.

#### MINOR SURGERY.

LATELY we have had a spate of books on minor surgery. However, the book with this title by Dr. Cecil Flemming can hardly be called a newcomer, as the first edition was produced in 1861, and it has now reached a twenty-third.

In the preparation of this edition the text has been considerably revised. In the light of the recent war changes have been made in the details of wound treatment, and more consideration has been given to the value of blood transfusion in severe injuries. Dr. H. N. Webber has again revised the chapter on anaesthetics.

After an introduction, which does not introduce anything in particular, follow chapters on sepsis and antiseptics, and on pre-operative and post-operative treatment with practical points about the conduct of operations. Wounds, accidents and hemorrhage take two chapters, and then a "mixed bag" of minor (and some major) conditions is dealt with in four more chapters. Chapter XI discusses dressings and bandaging, and there are three chapters on bones and joints and finally one chapter on anaesthetics. A very inadequate index is provided.

Although this book contains much useful material, it is difficult to see why it has needed to be published for eighty-five years.

#### THE RHESUS FACTOR.

G. FULTON ROBERTS'S concise, unassuming little book, "The Rhesus Factor", is a good "digest" of the immense volume of literature evoked by the discovery of the rhesus factor.<sup>1</sup> The author is to be commended for his use in the title and throughout the book of the term "rhesus factor" instead of the mystifying and inelegant "Rh factor" of earlier publications. This essay is intended, presumably, for the busy general practitioner, the medical student or the curious layman; it is popular rather than scientific. However, this does not excuse the startling inaccuracy of the opening sentence; the rhesus factor was discovered by Landsteiner and Wiener in 1940, not by Levine in 1939. Nevertheless, in view of the book's brevity and simplicity, there are surprisingly few omissions and inaccuracies; the subject matter is chosen with admirable restraint and illustrated by some well-selected case histories. The style is careless at times—for instance, in the opening paragraph of Chapter IV, and in the repeated use of "antenatally", "postnatally" and "routinely", words which should surely be seldom if ever heard and never seen. Apart from occasional faults, the writing is clear and pleasantly unaffected; it is as though the author says: "Come now,

<sup>1</sup> "Minor Surgery", by Cecil Flemming, O.B.E., M.Ch., F.R.C.S.; Twenty-Third Edition; 1946. London: J. and A. Churchill, Limited. 7½" x 4½", pp. 414, with many illustrations. Price: 14s.

<sup>2</sup> "The Rhesus Factor", by G. Fulton Roberts, M.A., M.B. (Cantab.); 1947. London: William Heinemann (Medical Books), Limited. 7½" x 4½", pp. 50. Price: 3s. 6d.

even if Rh has become Rh<sub>1</sub>, Rh<sub>2</sub>, Rh<sub>3</sub>, Rh', Rh", Rh<sub>γ</sub>, Rh<sub>δ</sub>, and rh (and maybe more), one can still explain the whole matter in 43 small pages of large clear type." And so he does, recommending in his friendly way that readers who require only an elementary knowledge of the subject should omit Chapter V on the Fisher nomenclature. Human nature being what it is, this is probably an excellent way of making any spirited reader tackle Chapter V, which is a rather over-condensed account of Professor Fisher's hypothesis. This chapter needs amplification; one cannot make an intricate thesis lucid by leaving out some of the steps in the argument. The advice given in the chapters on treatment and the collection of specimens is eminently practical. Throughout the book Dr. Roberts anticipates questions likely to occur to the general practitioner or his patients. This is useful, for the doctor confronted by a case of hæmolytic disease of the newborn has two problems: firstly, the treatment of the patient, and secondly, the duty of explaining the rhesus factor to worried, apprehensive or grief-stricken parents. The author wisely does not refer to such contentious matters as the advice about future pregnancies which should be given to the rhesus-negative mother of a child with hæmolytic disease of the newborn. The work is not documented; but a list of selected references for further reading is appended.

#### THE NATURE OF DISEASE.

It is nearly a quarter of a century since J. E. R. McDonagh regaled the medical profession with that remarkable essay in medical fiction, "The Nature of Disease". This earlier work, after a section on the sex life of *Leucocytozoon syphilidis* (alias *Treponema pallidum*), went on to propound an electrochemical theory of disease involving the hydration and dehydration of the protein particles of the blood plasma. Diagnosis of the state of the protein was based on the sedimentation rate, the viscosity, and the sugar and urea contents of the blood, and on the refractive index and ultra-microscopic appearance of the plasma particles. The mutations of the bowel flora were concerned in the relative states of health and disease, while treatment was based on the use of such chemotherapeutic agents as "S.U.P. 36", manganese butyrate and "Contramine".

Dr. McDonagh's latest work, "The Nature of Disease Up To Date", has the disadvantage, compared with his earlier book, of being largely incomprehensible to the average reader. His attention is still focused on the behaviour of protein, which now pulsates to the tune of the cosmic rays, contracting by night, during the winter and at death, and in the case of the female, at the intermenstrual period and during parturition. The factors which are held particularly responsible for disturbing this rhythm of pulsation, which is the basis of health, are claimed to be food grown in unhealthy soil (by the standards of Sir Albert Howard), intestinal toxæmia resulting from the consumption of such food, and the use of aluminium utensils. Diagnosis is still based on a study of the plasma protein, while with regard to therapy, colonic lavage, extracts of thymus and pituitary gland, miasmine (emulsions of microorganisms collected from human faeces), homeopathic remedies and the reeducation methods of F. M. Alexander have been added to the armamentarium of the Nature of Disease Institute.

It is not easy to take Dr. McDonagh seriously; yet his fantasies conceal an underlying foundation of important concepts—the unity of disease, the relative unimportance of specific causes, the importance of solar and other radiations and of the quality of protein in food in modifying susceptibility to disease, the necessity of studying disease in plants, animals and man as one subject, the possibility that viruses may arise in an organism by spontaneous generation, the thesis that the part played by microorganisms in the production of disease has been over-emphasized and that in particular environments they may undergo remarkable mutations, and the belief that treatment must be an attempt to restore a complex state of chemical equilibrium. However, fifty years must elapse before it can be decided whether Dr. McDonagh is the Paracelsus of the twentieth century or not, and meanwhile it cannot be said that this is a book that has any place in the library of the practising physician, who would be unwise to attempt, even if he was capable of so doing, to participate in such flights of ideas as those with which it is so liberally scattered.

<sup>1</sup> "The Nature of Disease Up To Date: An Outline of a Unitary Theory", by J. E. R. McDonagh, F.R.C.S., edited by M. Clement; 1946. London: William Heinemann (Medical Books), Limited. 8½" x 5½", pp. 134. Price: 15s.



## The Medical Journal of Australia

SATURDAY, SEPTEMBER 13, 1947.

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### THE SURGEON AND HIS TRUST.

WHEN the late Berkeley Moynihan delivered the Murphy Memorial Oration in 1920 immediately after he had, on behalf of the Royal College of Surgeons of England, presented the American College of Surgeons with a mace, he described J. B. Murphy at work in his operating theatre. In his introductory remarks to this part of his subject he used the following words: "The body of a man is the plastic material in which the surgeon works, and no art is worthy of such a medium unless it has in it something of a sacrament." These are noble words. When he uttered them, Moynihan had just referred to "brilliant" operators for whom it was the mere quality of effort which counted. Their ideal of operative surgery was something swift and infinitely dexterous, something to dazzle the beholder and excite his wonder that such things could be done by human hands. If there is something sacramental about the art of surgery, there must in the surgeon's ministrations be something of the priest. Those who exercise the priestly function in the sphere of religion are known to engage in religious exercises that they may renew their faith and keep themselves steadfast. There need therefore be no cause for surprise in the fact that at the clinical congress of the American College of Surgeons in December, 1946, Owen H. Wangensteen should present a paper entitled: "The Surgeon and his Trust".<sup>1</sup> This paper has already been mentioned in these pages in a short reference to the proceedings of the congress and the journal in which they were published.

In their surgical operations surgeons have more speedy and more direct power to make or mar a man than falls to those who practise other branches of medicine; but in spite of this, any lesson that may be learned, any renewal of faith that may be gained, from a study of Wangensteen's paper will not be for surgeons only. The speed and directness of surgical work are largely responsible for what may be described in the language of Hollywood as

the glamour that surrounds a surgeon. But glamour is in the eye of the beholder; for the surgeon himself speed and directness are at once his opportunity and his temptation. He knows that he must seize the one and spurn the other and as he succeeds in this so will he be faithful to his trust. This does not mean that speed should always be frowned upon, for sometimes speed is needed to save a life; it is speed for its own sake, speed as "glamour", that is to be deprecated. Wangensteen states that the safe conduct of a patient through an operation demands (a) adequate preparation of the surgeon, (b) careful and precise preparation of the dissection, (c) satisfactory preparation of the patient for, and adequate care of the patient after, operation. He directed his remarks especially (he was taking part in a symposium) to the surgeon's preparation of himself for his responsible tasks. He asks what surgeon would not prize highly an opportunity to be given a second chance to rectify an error of commission that shortened a patient's life—"an operation like any biological experiment is performed only once". "Why not prepare well for it?" he adds, because "death is so final". Wangensteen states that wise surgical planning limits the surgeon's range of activity. He points out that the Army Medical Corps during the second world war dealt successfully with difficult surgical problems because of planning, organization and the selection of persons with satisfactory training to do a given job. In civilian practice surgeons are left largely to their own devices; the result of their endeavours depends very much on how well they have laid their plans and how carefully they have carried out the details of those plans. "The range of operations which any one surgeon may perform is . . . a matter of personal choice." This is a subject of the greatest importance. Wangensteen thinks that it is a matter that demands some standardization among surgeons. This is one of the things that are easy to say but hard to put into effect. In the long run what a surgeon judges himself capable of doing and what he is willing to undertake have to be left to his conscience. We may take the matter further back than Wangensteen takes it and ask what type of practitioner should undertake to do surgical operations. In a country like Australia with its large distances and its remote and sparsely populated areas general practitioners must be prepared to operate in surgical emergencies such as acute abdominal conditions, and they obviously need some special training that they will be able to do this kind of work. Apart from this, however, there are some general practitioners in areas not so remote who within certain limits of their own devising do first-class surgical work. When Sir Gordon Gordon-Taylor was in Australia recently, he remarked, in the course of an address with anything but pleasure in his voice, that they still had a few general practitioner surgeons in Great Britain. It is probably true that as time passes operative surgery will pass more and more into the hands of those specially trained to do it. The point that we wish to make is that those surgeons who advocate this restriction of the surgical field should do a little stocktaking of themselves. Wangensteen remarks that there are still a few surgeons who affect to believe that they can take all of surgery for their province. He holds that they know as well as anyone that their performance in such a wide category of operative procedures is

<sup>1</sup> *Surgery, Gynecology and Obstetrics*, April 15, 1947.

sub-standard in some of these areas when it is judged in the critical light of what constitutes good practice. This is a point that might be considered by those general surgeons in this country who do prostatectomy when a urologist is available or who remove a tumour-bearing uterus when a gynaecologist is at hand. The list need not be extended. This part of the subject may be summed up in the terms of the title of Wangenstein's article with the declaration that the surgeon who restricts his activities to a sphere in which he is thoroughly competent, a sphere which he can adorn, will not betray his trust.

The practice of surgery is not confined to the cure of disease or even to its prevention. Experience in disease prevention and treatment and the study required to maintain proficiency generally lead to an acquisition of knowledge and this knowledge the practitioner is bound to hand on to his colleagues and successors. The ancient Hippocratic Oath contains a provision that knowledge of the "Art" shall be imparted to others. On many occasions in the past we have insisted in these pages that, if he does nothing else to add to the sum of medical knowledge, the practitioner should at least record important observations that may be of use to others. Wangenstein points out that the background of a surgeon's training should be broad. He holds that a sure foundation on which a surgeon can build is provided by the study of physiology, biochemistry or bacteriology. Addressing his fellow-surgeons, he said that they were all debtors to their profession and that from those who had enjoyed opportunities above the ordinary, society might reasonably expect that they should try to add something to the sum total of knowledge and not be content to be parasites upon their common heritage. Apart also from the individual, the higher institutions of learning have a responsibility to surgery. This collective responsibility will be discharged if the individuals attached to the institutions realize what should be done—the responsibility comes back inevitably to the individual. Several other aspects that concern the individual are mentioned by Wangenstein and one of them is the influence that surgical meetings may have on intellectual growth and development. This need be little more than mentioned. Wangenstein makes a good point when he states that man cannot lift himself up by his bootstraps and that surgical societies cannot increase surgical knowledge save in so far as they encourage an exchange of ideas between surgeons at the best possible level.

Surgery is not static. Its progress must go on, for without progress it will become sterile and die. What has happened during the last few years in brain surgery and in surgery of the thorax shows what can be done to extend the range of operation. In the same way the study of thyrotoxicosis and its treatment with drugs of the thiouracil type shows that it is still possible to make surgical operation unnecessary in a sphere which once yielded good results to the scalpel. Further progress awaits men with devotion and singleness of purpose who have a sacramental attitude to the practice of their profession. To all who claim surgery as their calling, the words of Saint Paul to Timothy may well apply: "Keep that which is committed to thy trust, avoiding profane and vain babblings, and opposition of science falsely so called: which some professing have erred concerning the faith."

## Current Comment.

### PNEUMONIA IN OLD AGE.

OSLER's transference of Bunyan's epithet "Captain of the Men of Death" to pneumonia is still famous, though perhaps the recent interest in the so-called virus types of more benign pneumonic infection and the great effectiveness of modern methods of treatment have somewhat obscured the fact that pneumonia is still an important hazard of old age. About the time of the first world war definite advances were made in our knowledge of the types of pneumococci and their antigenic behaviour. The studies of Lister and others on natives on the Rand were followed later by those chemical studies on bacteria which demonstrated the antigenic importance of polysaccharides. Many experiments have been made on the problem of prophylaxis of pneumonia, though these, like all immunological work, have had to face the difficulties of type variations and of the brief periods over which protection has been gained. The recently published article of Paul Kaufman is of interest because it deals with one particular aspect of the question, that of pneumonia in old age.<sup>1</sup> He points out that most of the published figures deal with short periods only, and are invalidated by the fluctuations in the rates of incidence and mortality. For this reason his study began in 1937, and was carried out on patients in the higher age groups only, so that at least two variable factors in the experiments were reasonably well controlled. In addition, an equal control group of patients was observed, 5153 persons being observed in this way, while 5750 were immunized. Over a period of six years observations were made, a polyvalent polysaccharide for types I and II pneumococcus and later also type III being used. Kaufman and his associates previously have reported their results from a similar research carried out over a term of two years. They then found that the incidence rate among the immunized subjects was 1.3%, only one-quarter of that in the other group, while the mortality rates were even more favourable in the immunized series. Their total figures are comparable with these, but there has naturally been a considerable decline in the mortality rates during recent years. The incidence of pneumonia among the immunized persons was 17.2 per thousand, whereas it was 44 per thousand in the control series not submitted to immunization. Before use the polysaccharide preparations were subjected to tests on mice, and judged by these standards they were highly potent. No disquieting effects were noticed after the injections of polysaccharide, the local and general reactions being both rare and slight. The blood serum of the immunized subjects was examined to discover any changes in antibody titre against types I and II pneumococci; a great increase was found, especially in the case of type I.

It is, of course, interesting to know whether immunization conferred on the persons who were so treated additional powers of resistance which might save them from severe illness, even though they did not entirely escape. In general, clinical analysis of the illnesses observed showed that, while the picture seen in each group was much the same, the more severe manifestations, such as bacteriemia, toxic signs, effusions, empyema, and delay in resolution, were more often seen in the non-immunized group. A significant finding was the occurrence of greater numbers of pneumonic infections due to bacterial types other than I, II and III among the immunized group, as compared with the controls. This might be expected. It shows that immunization against the pneumococcus is largely specific, and takes us back to the earlier experiments on the Rand in South Africa when immunization against one bacterial type did not prevent the later occurrence of an outbreak of pneumonia due to another variety of pneumococcus. The value of pneumococcal immunization has been questioned, but this work gives more substance to the claims that some workers have made for this as a practical procedure.

<sup>1</sup> Archives of Internal Medicine, May, 1947.

Kaufman's suggestion seems to be well based, that there is evidence in favour of the use of active immunization against pneumococcal infections during epidemics, its value being greatest in the protection of persons in institutions and those who have a tendency to recurring infections.

### INFECTIVE HEPATITIS.

Few infectious diseases have been studied with such intensity of recent years as hepatitis of infective origin, and the experimental work done on volunteers has brought to light much interesting material. The early description of blocking of Vater's papilla confused the aetiology of the disease for a considerable time, but although unwarranted deductions were made therefrom, there is at least some warrant for believing that an inflammatory condition of the upper alimentary tract does occur. Without our entering the still debatable field of the exact nature of the hepatitis transmissible by human serum, it will be agreed that symptoms suggesting involvement of the stomach and duodenum in some degree of inflammation are observed in this condition, just as in the epidemic form of the disease. Hepatitis following experimental introduction of the presumed infective agent into volunteers is also accompanied by similar symptoms in the early stages. Advantage has been taken of this by W. Paul Havens, to whom we owe much recent knowledge, for with his associates S. D. Kushlan and M. R. Green he has presented the results of radiological and gastroscopic studies of human volunteers who have suffered an attack of hepatitis.<sup>1</sup> Other work has been published pointing to the frequency of pathological changes of the nature of gastro-enteritis, but this research sets the matter beyond doubt. Twenty-one healthy young male subjects were chosen. Radiological examination was carried out during the acute period of the experimentally induced hepatitis, and in half the number preliminary examinations were made before inoculation, and repeated during the acute phase and again during convalescence. Gastroscopic examinations were also carried out on six of the men before and during the illness. The diagnosis of infective hepatitis was accepted only after routine tests of liver function and the usual close clinical observation. Difficulty was found in interpreting the radiological findings, but this was overcome by the use of control examinations made before the illness. Filling of the upper parts of the duodenum was not always homogeneous, and there was evidence of increase in size of the mucosal folds and a narrowing of the intervening troughs. Increased irritability was also observed. Checking with the controls showed that it was inadvisable to rely on such findings in every case unless it could be demonstrated that a significant degree of change had taken place during the florid period of the illness. More convincing are the findings of the gastroscopic observations. In every instance the mucosa of the stomach appeared normal before inoculations were made. In half the men a striking change was seen during the pre-icteric and icteric stages of the illness, the mucosa now appearing red and fiery, with pools of exudate between the folds. In two subjects these changes had disappeared when later examination was made during convalescence, but in the remaining man some residual changes still persisted. It therefore may be accepted that acute inflammation of the wall of the stomach occurs during the early stages of infective hepatitis, though it must be admitted that the findings of these workers do not indicate that a close correspondence between the gastroscopic and the radiological changes exists. There is, however, good reason for assuming that the duodenum and probably also the upper part of the jejunum share in these inflammatory disturbances, and this is borne out in the observations made at autopsy in the occasional fatal case. Harold Ginsberg, in reporting a series of instances of hepatitis following and believed to be due to transfusion of homologous serum, records the finding of oedema and congestion of the mucosa

of the stomach and duodenum and upper part of the small intestine at post-mortem examinations of soldiers dying after severe wounds. In these men jaundice occurred, believed to be a late result of transfusion with serum. There have been numbers of similar observations made by others.

Although we no longer assign a causal role to duodenitis in the production of jaundice in hepatitis of these kinds, we now have proof of the existence of an acute gastritis in the early stages, and the modern high protein diet of more generous type should not be pressed too soon during the period of acute involvement of the upper part of the digestive tract.

### THE COMPULSORY PREMARITAL SEROLOGICAL TEST FOR SYPHILIS.

No one denies that it is undesirable that persons suffering from active syphilis should marry; far less is it desirable that they should have children. Most people agree that a routine premarital serological test for syphilis is a sound measure. Beyond that point, however, the subject becomes highly controversial. It has been strongly contended that a positive result to the serological test in the case of either partner is sufficient ground for a legal prohibition of marriage. Valid objections to this attitude include the fallacies, both technical and biological, inherent in the tests, the personal rights and social reputation of the individual especially in so far as they may be affected by the imperfect test, and the impossibility of legislative control of premarital or extramarital intercourse. A sincere and restrained attempt to meet the problem has been made in Alberta, Canada, and Harold Orr, Director of the Division of Social Hygiene of the Department of Public Health of the province, has discussed the measures adopted and the preliminary results.<sup>1</sup> He points out that arguments such as those outlined above are advanced against the institution of a compulsory premarital serological test, based on the premise that marriage would be prohibited in the presence of a positive result from the test. The problem is to find a sound compromise between dictatorial legislation which might quite unjustly prevent marriage and a weak inactivity which allows the marriage of persons suffering from unsuspected syphilis. The measure adopted in Alberta was incorporated in an amendment to *The Solemnization of Marriage Act* requiring both parties to a marriage to present to the issuer of marriage licences or to the clergyman prior to the publishing of the banns a certificate from a doctor, which states that he has taken a specimen of blood for the serological test for syphilis; that it has been sent, or will be sent, to an approved laboratory and that he will inform the person concerned of the result. No attempt is made to prohibit marriage if the result of the test is not negative. The wisdom of this will be seen from some of the results quoted by Orr. In 1946 there were 20,298 premarital tests performed in Alberta. A study of a 10% sampling indicates that, of these, 254 yielded a positive result in persons who did not suspect that they might be infected. Seven could not be traced after the test, but in the end, after some months of observation and reexamination, 50 of the remainder were found to have had "false positive" results, leaving 197 probably syphilitic. Treatment facilities were placed at the disposal of the latter group. Prohibition or compulsory postponement of marriage would have caused great and unjustified unhappiness and embarrassment to many of these couples. The procedure does not even require that the other partner be told the result of the test, mainly again because of the fallacies of the test and the desire to avoid unnecessary embarrassment and unhappiness. It will thus be seen that the Alberta measure is restricted in its provisions, and Orr concedes that, with experience, modification may be necessary. It is a constructive measure and will do good. It may not satisfy the more ardent reformers, but one cannot but feel that it is a democratic piece of legislation.

<sup>1</sup> Archives of Internal Medicine, April, 1947.

<sup>1</sup> Canadian Journal of Public Health, May, 1947.



## Abstracts from Medical Literature.

### DERMATOLOGY.

#### Degenerative Colloidalis Cutis Solaris: Purpura Solaris.

CHAIM BERLIN (*The British Journal of Dermatology and Syphilis*, November-December, 1946) states in a long article on colloid degeneration of the skin that men and women are about equally affected. He says that the disease is most common in advanced middle age; in but a few instances it begins during the second decade. His patients belonged to a special type. They all had fair skin, blond hair and blue eyes. Most of them were rural labourers or otherwise persons constantly exposed to the sun, and presented, in addition to colloid degeneration, other solar damage. The localization is very typical, only the uncovered parts being involved, particularly the face in its upper half, the ears, neck, and back of the hands with the adjacent parts of the forearms and the proximal phalanges of the fingers. The eruption is rather uniformly described by most authors as consisting of small pin-head-sized, non-inflammatory, slightly elevated, solid or translucent, somewhat glistening papules or pseudovesicles. They are discrete and closely aggregated, often grouped but seldom coalesced, and coloured in different shades of yellow, often lemon-yellow. The histological picture is very typical. The epidermis is thinned, in places reduced to three or four rows of cells; the rete pegs are flattened or even completely absent. Separated from the epidermis by a narrow band of connective tissue, there are the essential and fundamental changes in the upper portion of the corium. They are homogeneous colloid masses appearing as variously sized and shaped yellowish blocks with van Gieson's stain. The general health is not affected. Many authors consider the etiology as unknown. Following the concept that vitamin C is an important factor in regulating the development of collagen, Way believed that the disease is due to vitamin C deficiency. Everything indicates the considerable importance played by the sun's rays in producing this disorder. The occurrence predominantly in persons exposed to sunlight, the nearly exclusive involvement of uncovered parts and the occasional aggravation in summer are additional proofs.

#### "Evipan" Used in the Investigation of Some Chronic Dermatoses.

L. FORMAN (*The British Journal of Dermatology and Syphilis*, February, 1947) describes a number of cases investigated while the patients were under the influence of "Evipan" given intravenously. The study was carried out on patients selected from a number with recurrent or chronic dermatoses, in whom progress had been unaccountably delayed. The patients, some of whom had been admitted to hospital many times before admission to this unit, were rested, were not exposed as far as could be ascertained to cutaneous irritants, and were treated by orderlies and nursing staff. In many cases, symptoms and signs were exaggerated; for example, itching would be described as severe and intolerable, although

cutaneous changes were slight, the general condition had not deteriorated, and the observed hours of sleep were not significantly restricted. It was evident that in many of the patients the cutaneous disorder was protracted by psychological factors. Excoriations, particularly when deep, were reliable signs in this direction. A short "Evipan" analysis cannot take the place of a careful personal history by a trained psychologist and of his evaluation of personality and the effects of mental trauma. Dermatologists must, however, in their consideration of skin disease, form an estimate of the patient's mental state and decide whether encouragement and support alone will be adequate or whether it is necessary to advise further psychological treatment. The author states that in the investigation "Evipan" was given slowly, in a 1% solution intravenously, until the first stage of anaesthesia was reached (that is, cessation of counting, alteration of the rhythm of breathing, or yawning). Usually 0.4 gramme of the drug was sufficient. The patient was then questioned, any answer that appeared of significance being pursued. If replies became guarded or ceased, more "Evipan" was given until the patient was again relaxed and sleepy, resistance to questioning again removed, and answers freely given. To summarize, "Evipan" narcosis offers a quick and probably reliable method of psychological investigation of value to the dermatologist, particularly if the services of a psychologist are not readily available.

#### Topical Treatment with Penicillin Ointment.

CARROLL S. WRIGHT AND E. R. GROSS (*Archives of Dermatology and Syphilology*, January, 1947) report that the parenteral use of penicillin has now reached the stage at which its efficacy in a wide variety of diseases has been well established, although its full clinical possibilities as a local therapeutic agent are yet to be realized. Roxburgh, Christie and Roxburgh used a penicillin ointment to treat fifteen patients with *syphilis barbae*, obtaining permanent cures in five instances and initial cures in three, with relapse and permanent cure following a second course of penicillin ointment. Treatment of the other seven patients was either a failure or caused irritation of the skin. The authors' objective in this study was to ascertain the results obtained in the treatment of a variety of superficial dermatoses with penicillin locally in the form of an ointment consisting of 1000 Oxford units of calcium penicillin per gramme in a base of hydrous wool fat and white petrolatum. Patients were instructed to apply the ointment liberally three to four times daily on the infected areas, and in other instances dressings were employed, which were changed twice daily. All patients were advised to keep the ointment continually refrigerated. The group of 131 patients had miscellaneous infections, including impetigo, intertrigo (mixed infections), eczematoid dermatitis, paronychia, *syphilis vulgaris*, ulcer, carbuncle, furuncle, ecthyma, *moluscum contagiosum*, rosacea, dermatophytosis and seborrhoeic dermatitis. Penicillin ointment appeared to irritate the skin of many of the patients. The authors attempted to ascertain which constituent of the ointment was responsible by applying to their so-called

sensitive patients patch tests with the penicillin ointment alone, with hydrous wool fat and with petrolatum. No positive result was elicited from the patch tests. Of these 131 patients, 21 of a total of 25 suffering with *impetigo contagiosa* were entirely cured within three days. None of the seven patients with infectious eczematoid dermatitis was cured. In the case of five patients with *acne vulgaris* the treatments were complete failures. Six of twelve patients with superficial folliculitis (simple) responded to treatment. For eight patients with *syphilis vulgaris* treatment resulted in utter failure. The authors find that penicillin ointment is of value chiefly in the treatment of *impetigo contagiosa* and of ecthyma.

#### Chronic Latent Oral Moniliasis (Thrush).

SAUL S. ROBINSON AND SAMUEL TASKER (*Archives of Dermatology and Syphilology*, January, 1947) report a case of twelve years' duration in which oral moniliasis was resistant to treatment. Monilial infection of the mouth, or thrush, is common in infants and is occasionally observed in children and adults. The disease usually responds readily to local treatment and proper oral hygiene and cleanliness. There are, however, instances of oral thrush of a chronic latent type, resistant to all known therapy. A recent survey of twelve large dermatological clinics in the United States indicates that the chronic latent form of the disease is constantly encountered in dermatological practice. The paucity of case reports in the medical literature and the omission of mention of the disease in this form in most dermatological textbooks apparently indicate that chronic latent oral thrush has received little or no attention. It is the purpose of the authors' article to call attention to the resistant latent type of chronic oral moniliasis. Reports of the development of leucoplakia and epithelioma in chronic latent oral moniliasis in adults indicate that this disease should be classified as precancerous. Treatment of vaginal moniliasis should especially be instituted during pregnancy to prevent infection of the foetus as it passes through the birth canal, as suggested in the case reported, in which the mother of a girl with chronic latent oral moniliasis of twelve years' duration had both oral and vaginal infection of the same type.

#### "Fixed" Eruptions Caused by Sulphadiazine.

LIONEL M. COLE (*Archives of Dermatology and Syphilology*, December, 1946) states that many eruptions of different types have been described following the oral and topical administration of the sulphonamide compounds. The commonest reactions to sulphadiazine are macular eruptions, febrile reactions and conjunctivitis. "Fixed drug" eruptions are rare following administration of sulphadiazine. In the literature so far, few cases of involvement of the mucous membrane following administration of sulphonamide drugs have been reported. The author reports three cases in particular because of the existence of both these phenomena, that is, fixed eruptions of the mucous membrane and of the skin following sulphadiazine therapy. He states that these three cases are examples not only of cutaneous reactions to sulphonamide compounds, which are commonly seen, but also of involvement

of the mucous membrane, a phenomenon rarely noted. Their occurrence as "fixed" eruptions, both of the skin and of the mucous membrane, makes them all the more noteworthy.

### Acne Vulgaris and Vitamin A.

FRANCIS W. LYNCH AND CHARLES D. COOK (*Archives of Dermatology and Syphilology*, March, 1947), in order to arrive at an opinion, determined to observe the effects of vitamin A given orally in a dosage of 100,000 units daily to a group of university students with acne. About one-third of the group had previously received treatment by other physicians, with little or no effect. Neither they nor those without previous treatment were given any other measure to use while taking vitamin A, and they were given no advice as to diet or hygiene. The duration, extent and severity of their acne varied within wide limits. Patients were asked to return for observation every three to four weeks. In 46% of cases results could be classed as good, though in only one case could the acne be spoken of as cured. The authors conclude that the treatment of acne by oral administration of 100,000 units of vitamin A daily seems not to be generally advantageous when continued for only three months.

## UROLOGY.

### Penicillin in the Treatment of Gonococcal Infections.

MANSON MEADS AND MAXWELL FINLAND (*American Journal of Syphilis, Gonorrhea and Venereal Diseases*, November, 1946) present an analysis of the results reported in the literature throughout the year 1945 of the penicillin treatment of gonococcal infections. Gross cure rates of between 92% and 95% were obtained from the initial course of parenterally administered penicillin in 21,936 cases of acute gonorrhoea. The drug was given in the doses most commonly used, namely, between 75,000 and 200,000 units. A dose of less than 75,000 units gave significantly lower cure rates, except perhaps when penicillin X was used. There were also lower cure rates with an initial course of 200,000 units or more, but this was probably related to the choice of patients for treatment. There were no important differences in the results obtained with similar doses given in aqueous solutions, by intermittent intramuscular injections or by single intramuscular injections in beeswax-peanut oil or in water-in-oil emulsions. The results obtained with single injections of aqueous solutions were inferior to those obtained with the same number of units given in divided doses. It is possible that full doses of an effective sulphonamide, such as sulphathiazole or sulphadiazine, given for five days and supplemented by a course of 100,000 or 200,000 units of penicillin in divided doses given intramuscularly, may give better results than similar doses of penicillin alone. Sulphonamide resistance of gonococci does not affect their sensitivity to penicillin. The number of patients treated with orally administered penicillin is too few, and the factors involved are too many to permit of any final deductions concerning the efficacy of this form of treatment. However, present indications are that a minimum oral dose of about 600,000 units or

more given in divided doses at least half an hour before meals may be necessary to achieve results similar to those afforded by the usual parenteral doses. Chronicity and the pressure of focal purulent complications are probably the most common causes of treatment failures, but the possibility of penicillin-resistant strains of gonococci and of low potency or rapid deterioration of some lots of penicillin has to be considered. Some focal gonococcal infections, particularly those that are early and mild, yield readily to the usual course of treatment for gonorrhoea, but severe and chronic infections probably require more prolonged treatment. Puerile arthritis may require local (intra-articular) injections of penicillin, and surgical drainage of focal abscesses may be necessary before a complete cure is obtained. The possibility of masking, modifying or delaying the appearance of early syphilitic lesions in patients treated for gonorrhoea with small doses of penicillin has to be noted.

### Streptomycin Therapy.

S. L. RAINES (*The Journal of Urology*, January, 1947) expresses his views as to the present status of streptomycin therapy in so far as it concerns urology. According to Waksman, the discoverer, the search was for an antibiotic substance capable of exerting a bactericidal effect on Gram-negative bacilli not too toxic to the body and not inactivated by the body fluids. In the author's opinion, streptomycin has achieved most of these aims and has helped to close the ring of therapeutic agents which is being forged around the organisms causing the bulk of urinary tract infections. In treatment, it is very important to administer continuously an adequate dose, maintained until the organism is destroyed. Otherwise a strong streptomycin fastness is developed and cure then becomes extremely difficult. However, in such cases experiments have recently shown that the exposed organisms have become less pathogenic even though they have not disappeared from the urine. It has been found that the *Bacillus pyocyaneus* and *Pseudomonas aeruginosa* resisted the drug in almost every instance. Removal of stones, drainage of pus and aseptic technique in all instrumentation are necessary to allow streptomycin to exert its full effect. Titration *in vitro* in each individual case makes it possible to determine the resistance of the organism concerned and then to estimate the dose necessary. The dose will vary from two to three million units per day, but the trend should be to use higher doses and to clear the urine in two or three days at most. Recent batches of streptomycin have been free from any toxic effects. Liver and kidney function are not affected and no skin rashes have been seen.

J. D. ADCOCK AND R. T. PLUMB (*The Journal of the American Medical Association*, March 1, 1947) state that streptomycin has been shown to be effective *in vitro* against various Gram-negative bacilli met in urinary infections, these bacilli having proved resistant to sulphonamides and penicillin. The present paper is based on the study of streptomycin action in eleven patients with Gram-negative urinary tract infections. The bacilli in all these cases proved to be sensitive to streptomycin *in vitro*. In eight of these cases the infection was pure; in

three it was mixed. It is agreed by all observers that this antibiotic substance must be injected in large doses at the beginning and the germs killed as quickly as possible, for they develop in most cases a streptomycin resistance. So far treatment has been fettered by inadequate supplies of the antibiotic, and it is likely that when that becomes adequate the dose will be about three million units per day in divided doses, intramuscularly or by intravenous infusion continuously. The results were most impressive in the case of five patients with chronic infections due to the *Aerobacter aerogenes* and the good effect remained after the streptomycin was discontinued. The five patients in whom *Pseudomonas aeruginosa* was present alone or in combination with other germs responded fairly well, but less satisfactorily. In the one case of pure *Escherichia coli* infection, the patient's symptoms were relieved but the bacilluria persisted. However, most *Escherichia coli* infections respond well to sulphonamides, and this case was included in the series only for scientific interest. In most instances a bactericidal effect was obtained when the serum concentration of streptomycin was about ten times that required for inhibition of growth of the organism concerned *in vitro*. The concentration obtained in the tissues is the important factor in chronic infections and not merely the concentration in the urine. It is not known yet whether the development of streptomycin resistance by germs is of frequent occurrence. If it proves to be so, then the early dosage may have to be massive.

### Vesical Management in Spinal Cord Injuries.

G. C. PRATHER (*The Journal of Urology*, January, 1947) has come to certain conclusions on the problem of bladder care after spinal injuries, and his thoughts are the result of experience with sixty-one patients from the recent war. Of these, twenty had complete transection of the cord and forty-one partial transection. In the group of twenty there were only two deaths. At the time the author left military service, thirteen of this group were passing urine with an "automatic bladder". In the group of forty-one with partial transections, there were no deaths at all and thirty-nine had resumed voluntary micturition. The author sees no reason for catheterization after spinal injury, unless urinary retention is clearly demonstrated. If, however, it is certain that the bladder will not take up its function, constant drainage with a number 18 French catheter should be instituted, the catheter being connected with a closed system of drainage with either manual or tidal irrigation. If the neurological survey indicates complete transection, suprapubic cystostomy should be performed, since several methods of drainage will be necessary, and it is best to spare the urethra the pressure of a catheter for most of this time. Periodic cystometric study and intravenous urography should be performed. When the general condition has improved, ambulation is in near prospect and the bladder shows a satisfactory cystometric response, measures can be instituted to permit it to resume activity. The aim should be voluntary micturition in patients with partial transection and involuntary periodic automatic micturition in those with complete transection.



## British Medical Association News.

### SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Royal Prince Alfred Hospital on May 22, 1947. The meeting took the form of a series of clinical demonstrations by members of the honorary and resident medical staff of the hospital. Parts of this report appeared in the issues of August 2, August 30 and September 6, 1947.

#### Dermatitis Herpetiformis Controlled by Sulphapyridine.

DR. RICHARD PERKINS presented two patients with *dermatitis herpetiformis*. His first patient was a male, aged twenty-seven years, who had had crops of intensely itchy blisters on the buttocks, knees and elbows for three years. On examination groups of vesicles on an erythematous base were present over the hips. On February 12, 1947, treatment was commenced with sulphapyridine 0.5 gramme three times a day, which completely relieved the itching and resulted in the disappearance of the rash. On May 11 the patient reduced the dosage to 0.5 gramme twice daily. Relapse of the rash occurred on the hips six days later. Repeated blood counts had shown no fall in the number of leucocytes.

Dr. Perkins's second patient was a male, aged thirty-three years. Since May, 1944, he had suffered from an intensely itchy, widespread rash except when taking sulphapyridine. When presented he had on the trunk and limbs a widespread erythematous macular rash with numerous scratch marks. When first seen in March, 1946, the typical groups of irregular vesicles surrounded by an erythematous halo had been present. Since March 22, 1946, he had been taking sulphapyridine, at first two grammes daily, and since October, 1946, three grammes daily. On this treatment the itching and to a large extent the rash were controlled, but a few breaks in the treatment were followed in a few days by a severe relapse. Substitution of "Benadryl" 50 milligrammes three times a day on May 2, 1947, was followed in a few days by a severe relapse. Treatment with sulphapyridine was then recommended. Frequent blood counts had shown no fall in the number of leucocytes.

#### Regeneration of Bone following Deep X-Ray Therapy.

DR. F. DUVAL showed a series of X-ray films illustrating the regeneration of bone following deep X-ray therapy.

The first was of a giant cell tumour of the mandible treated by one course of deep X rays in 1941. The films illustrated the slowness of bone regeneration as seen in radiographs, although clinical improvement occurred early. By the end of 1943 the bone was almost normal. Two opposing fields were used, 2,000r to each over two weeks.

The next was of secondary carcinoma of the thyroid gland in the lumbar section of the spine and right femur. The patient had been admitted to hospital on May 16, 1946, with a history of severe pain in the right buttock and thigh for four months. She was bedridden. X-ray examination revealed metastatic involvement of the pedicle and body of the third lumbar vertebra with fracture of the transverse process. There was irregular bony absorption in the lower third of the right femur also due to metastases. X-ray treatment commenced on May 16. A tumour dose was administered to the spine of 2,600r in five weeks and a tumour dose to the femur of 1,700r in nine days. Further treatment was given in November. The pain was relieved during the treatment, and the patient, when seen in March, 1947, was walking well. It was then found that there was a mass in the right lobe of the thyroid increasing in size. This was regarded as the primary growth and treated by deep X-ray therapy. The latest report on May 20, 1947, was that the patient was well and doing her own housework.

The third case was one of carcinoma of the breast with metastases in the scapula and humerus. The films revealed large metastases in the scapula so that the outline of the bone was barely visible, a pathological fracture of the clavicle and marked osteoporosis of the head of the humerus. The patient was treated with radiation produced by a current of 275 kilovolts filtered through 0.2 millimetre of copper and one millimetre of aluminium. The dosage was 2,500r anterior and posterior to the shoulder. This resulted in firm bony union with ankylosis of the elbow joint.

The fourth group of films were of neoplasm (probably secondary) of the right femur occurring in a patient, aged twenty-eight years. The patient had had pain in the right thigh for four months prior to seeking medical advice, with

a limp and then the appearance of a distinct lump. Examination on October 1, 1946, revealed irregular areas of absorption and sclerosis in the upper third of the right femur with thickening of the cortex and marked periosteal reaction. A biopsy specimen contained masses of rather undifferentiated epithelial cells invading the bone. These were considered to be secondary carcinoma of indeterminate origin. No primary growth could be found. Treatment was given with 200 kilovolts filtered through two millimetres of copper and one millimetre of aluminium. A tumour dose of 2,200r was given over sixteen days in October, 1946. A further dose of 1,500r was given in February, 1947. X-ray examination on April 1, 1947, showed that the lesion was stationary. Further bone regeneration had occurred. At the time of the meeting the patient was free from pain and could walk. No primary lesion had been found.

Dr. Duval also showed films of the following newgrowths: (a) Ewing's tumour of bone. (b) An osteogenic sarcoma treated by X radiation, followed by amputation later. Since treatment the patient had been well for thirteen years. (c) Metastases from carcinoma of the breast in the spine and the pelvis.

#### Plastic Surgical Repair.

DR. D. OFFICER BROWN demonstrated patients to illustrate the application of principles of plastic surgical repair to major skin losses of the lower limbs. The special difficulties of repair of lower limb wounds involving deep tissues, muscle, tendon and bone were emphasized. He stated that free skin grafts were used in the treatment of superficial losses, such as those resulting from burns, in which the deep fascia was not involved. Most of the wounds due to vehicle injuries, gunshot wounds and tropical ulcers required some more extensive procedure and the patients presented illustrated the transfer of cross leg flaps and abdominal tubed pedicles in their various stages. It was pointed out that the basic requirements were sound healing with stable scars in reasonable time and freedom from muscle and tendon fixation. In some cases the use of local flaps (usually with an associated graft) satisfied the cardinal postulates. In the leg, however, local flaps were less generally applicable than in other parts of the body, on account of the relative lack of spare or loose skin. It was more often preferable to bring in skin from a distance, and flap skin from the other leg was shown to provide the ideal repair if the area of loss was not too large. One patient was shown to illustrate the sound union of a previously ununited fracture, the union occurring after radical scar excision, including sequestrectomy, and covering with an abdominal tubed pedicle. The patient had been referred from an orthopedic surgeon and it had been intended that the skin repair should provide an essential preliminary to bone grafting. It was pointed out that it was a not uncommon occurrence for bone union to occur rapidly following adequate skin repair. Improvement in blood supply appeared to be the factor which encouraged rapid bone regeneration.

A MEETING of the Paediatric Section of the New South Wales Branch of the British Medical Association was held at the Royal Alexandra Hospital for Children, Sydney, on March 7, 1947.

#### Pertussis Immunization.

DR. CLIFTON WALKER then presented a paper based on 1,000 cases of pertussis immunization in his practice. He said that the subject of pertussis immunization had occupied the attention of paediatricians since the discovery of the causative bacillus in 1906. Ten years later it was demonstrated that marked differences existed between recent and old strains, and the distinct phases antigenically gave an impetus to prophylaxis. A complaint which was responsible, as was pertussis, for such a large number of deaths among children under two years of age, probably more than diphtheria or scarlet fever or measles, and carrying such morbidity from bronchiectasis and cerebral lesions, was worthy of some attention from the preventive standpoint. The problem of prophylaxis had received considerable stimulation by the work of Sauer, who stressed that recently isolated strains from definite cases of pertussis should be used in the preparation of the vaccine.

Dr. Walker said that for a protective scheme to receive widespread approval, it had to be effective enough to make it a routine procedure in infant care. With such a killer as whooping-cough one should not be asked to wait till the immunization was in the vicinity of 100% in effectiveness. After all, an attack of pertussis itself did not offer a guarantee against a recurrence, and immunization likewise had its limitations. Many surveys, however, showed a considerable superiority in protection amongst the vaccinated.



As children in crowded suburbs seemed to show a greater incidence of pertussis than children in less thickly populated areas and to suffer more complications and a higher morbidity and mortality, it became a matter of public importance that a governmental scheme should be introduced if inoculation could be shown to be reasonably effective. An immunizing programme should aim at achieving the highest possible degree of immunity with a minimum of local or constitutional reactions. It was well to keep in mind that vaccinated children might develop a mild atypical type of pertussis which would be difficult of diagnosis, and yet those children would spread the disease amongst the unvaccinated.

Dr. Walker went on to say that, granted that the inoculation was established as affording reasonable protection, they had to decide on the optimum age for injections, the type of vaccine with its concentration and dosage, the time interval between injections, and the site of injections; and consideration had to be given to the reactions, their prevention and treatment.

Discussing the question of the optimum age, Dr. Walker said that it seemed to have been generally accepted that infants under the age of six months did not develop a great degree of immunity on account of their inability to elaborate antibodies, but some recent work by Sako *et alii* suggested that young infants did respond by antibody production after immunization. The study included 16,000 infants below the age of two months who had been immunized with alum-precipitated vaccine, and the results showed a most definite protection for the infants. Dr. Walker then referred to a subsequent article in *The Journal of Pediatrics* of October, 1946, by W. W. Waddell *et alii*, who had demonstrated that very young infants could be effectively protected by immunization. They administered pertussis vaccine in doses of 20 billion organisms at the age of one week, 40 billion three weeks later, and a further 40 billion when the infant was two months old. Most infants under six months were susceptible to whooping-cough, and the mortality among them was high. It had been shown that only about 15% had some degree of immunity. Few cases were recorded among very young babies, partly because of an inherited immunity acquired from the passage of antibodies through the placenta. This appeared to be valid, as it had been held that deaths among young infants were more numerous if the mother had not suffered from pertussis. Another reason for the low incidence might be the comparative isolation for the young infant. Inherited immunity, however, could not be absolutely relied on to protect the infant, and isolation was not always a practical measure. The only effective methods of dealing with the very young infant would be by active immunization or by the transmission of a passive immunity through the placenta by active immunization of the mother. The latter could be guaranteed by inoculating prospective mothers with pertussis vaccine during the last three months of pregnancy. Tests reported by Cohen and Scadron in *The Journal of Pediatrics* of November, 1946, had demonstrated that both the newborn and their mothers showed adequate protection. A fluid vaccine with a total of 120 billion organisms had been administered. Doses were 15 billion, 30 billion twice, and finally 45 billion organisms. Incidentally fluid diphtheria toxoid had been given at the same time. In no case was the pregnancy disturbed owing to any severe reaction. This passively conferred immunity seemed to be adequate for the baby for the first six months of life, after which active immunization might be undertaken.

The same principle has been accepted in many maternity hospitals in connexion with the prevention of hæmorrhagic disease of the newborn, vitamin K being given to the mother at the onset of labour for transmission to the fetus via the placenta.

In discussing the type of vaccine, Dr. Walker said that many types had been used during the previous few years. Antibacterial vaccines were widely employed, but the significance of the toxin had also received much attention. The antibacterial vaccine might be a plain fluid vaccine as employed originally by Sauer and as currently made by the Commonwealth Serum Laboratories. Some authorities had advocated a mixed vaccine containing *Hæmophilus pertussis*, and, in addition, bacteria found in the upper respiratory tract. Lately Sauer had shown a preference for the alum-precipitated vaccine, holding that that product was of high immunizing value because the alum enhanced the antigenic effect; the antigens were slowly absorbed and could manifest their immunizing properties continuously over an extended period of time. In January, 1946, he had made the following statement: "All investigators who have reported on a comparison of results with plain and alum-precipitated vaccines found a higher degree of protection with smaller doses of the latter." Lapin, however, in a recent article in *The Journal of Pediatrics*, July, 1946, had stated that "the use

of alum-precipitated vaccines of *Hæmophilus pertussis* is condemned on the ground of frequent severe reactions". A combined vaccine for immunizing against pertussis and diphtheria at the same time had been shown by Sauer (*American Journal of Public Health*, Volume XXXII, 1942, page 385) to be quite effective as revealed by Shick tests, and he had recommended it for consideration by health departments as well as by private physicians. Vaccine fractions such as the Petain vaccine, which had been thoroughly washed to remove endotoxin, and another called "Topagen", had had their day, as a loss of the immune principle in their preparation had been proved. A vaccine fraction widely used in America had been "Detoxified Pertussis Antigen" (Lederle Laboratories); but a study conducted by the Boston Health Department in 1942 to compare the relative merits of Lederle's toxoid and Sauer's bacterial vaccine had shown the latter to be much more effective. All investigators seemed to agree on the necessity of using phase I organisms from the catarrhal stage in the preparation of whooping-cough vaccine.

On the question of concentration, Dr. Walker said that the concentration of the fluid vaccine had varied over the years from 30 million to 40 billion organisms per millilitre, and the tendency lately had been towards the higher concentrations. Sauer's original vaccine contained 10 billion organisms per millilitre; a few years later he recommended 20 billion, but on account of severe reactions reduced the concentration to 15 billion.

Dr. Walker went on to discuss the matter of dosage. After years of experimenting, Lapin had stated that the total dosage for fluid vaccines should be 120 billion organisms, whilst Sauer had suggested 90 billion. Many other authorities were in agreement that the larger dosage was more effective. In view of that it would seem that the 40 billion course recommended by the Commonwealth Health Department was inadequate. With alum-precipitated vaccine, for reasons previously stated, the total dosage necessary for immunity appeared to be much less than in the case of the fluid vaccine.

Referring to the time interval between inoculations, Dr. Walker said that the interval originally advised by Sauer had been seven days; but he (Sauer) had recently advocated a period of four weeks between each two consecutive doses, as complement fixation tests showed a greater protection with the longer interval, and also a lessening of the systemic reactions. This was convenient from the point of view that the inoculation for diphtheria might be made to coincide, as the optimum interval for injection was about the same. The combined inoculation for diphtheria and pertussis at each visit was a saving of time for both patient and physician.

Referring to the site and mode of injection, Dr. Walker said that it was generally recommended that the inoculation be made subcutaneously, although Sauer had originally suggested that some at least of the injection should be intracutaneous. Some authorities had used the intramuscular route; but Dr. Dorothy Gepp, medical research officer of the Melbourne Children's Hospital, had found that that route gave a poor antigenic response. That fact might explain the results of the English workers in the Oxford City experiments in 1945 reported in the *British Medical Journal* of August 18, 1945; they had concluded that there was no evidence that pertussis vaccine had any prophylactic value. It was noted that their inoculations were made intramuscularly. Dr. Walker said that the arms were used in rotation and appropriate care had to be given to the syringe and needles. In a pamphlet issued by Parke, Davis and Company it was recommended that when the injections were given the needle should be directed "distally". This in Dr. Walker's opinion was not the simplest method of inoculating a howling and struggling infant, and he was at a loss to know what prompted the suggestion. It had been advised that after the vaccine was withdrawn from the bottle a fresh dry needle should be affixed to the syringe to make the injection, in order to prevent contamination of the needle track.

Dr. Walker then went on to discuss reactions, which he said might be classed as local, constitutional or allergic. The local reaction was almost universal, and consisted of an inflammatory area which was tender for a few days; but induration with slight pigmentation might persist for several weeks. A local abscess (sometimes alluded to as a "sterile abscess") might develop, but it was rare. The constitutional reaction was usually moderate in degree, but might be severe. The symptoms were fever, restlessness and anorexia; but there might be vomiting, screaming and hyperpyrexia for some hours, if suitable precautions were not taken. The allergic reactions were most alarming and needed prompt attention. They were said to be uncommon

after the first injection, and to occur usually after the second. Symptoms might arise within one hour after the injection or be delayed for several hours. The usual manifestations were fever, dyspnoea and cyanosis. The baby looked desperately ill, but fortunately responded quickly to adrenaline given hypodermically.

Dr. Walker then reported on his own series of cases, which up to the time of the meeting numbered 1,000 (or a total of about 5,000 injections). The first inoculation had been given to most babies at the age of nine months. In the vast majority of cases the Commonwealth Serum Laboratories product had been used, as continuous supplies of Parke, Davis and Company's "Diph-Pertussis" vaccine could not be guaranteed. Four doses of two millilitres of C strength had been given every three to four weeks, to a total dosage of 80 billion organisms. When Parke, Davis and Company's vaccine was used, half a millilitre had been administered monthly for three doses, so that a total of 45 billion organisms was given. The site chosen was the forearm as a matter of convenience, the upper part of the arm being difficult of access in many cases on account of a tight sleeve. Ether was used to sterilize the skin, and the injection was made subcutaneously. In the majority of cases the diphtheria anatoxin was administered at the same time. To save some anxious telephone inquiries a few hours later, it was wise to prepare the mother for probable reactions such as restlessness, crying, fever, vomiting and disinclination for food, and a reddened tender swelling at the site of the injection. In an endeavour to minimize the baby's discomfort and to lessen the mother's anxiety, Dr. Walker always prescribed a sedative containing five grains of bromide of soda and two grains of chloral hydrate to be administered as soon as symptoms appeared, and to be repeated in four hours if necessary. Aspirin in a dose of two grains for an infant of one year was also suggested, and might be given twenty minutes before the sedative. Dr. Walker said that the infants inoculated by him had experienced all three types of reactions, local, constitutional and allergic, and there had been one death which possibly could have been attributed to a late reaction of an allergic nature. Local reactions were as previously described, and occurred with most infants. An abscess had developed at the site of injection on two occasions. There was no elevation of temperature, and no tenderness, and the lesion disappeared spontaneously without incision. In the case of a third infant an abscess appeared after the second injection which was given by a very capable locum tenens. The parents of the baby stated that a young medical friend of the family was definitely satisfied that it was caused by the use of a dirty needle, and that misguided opinion naturally impelled them to change their medical attendant. Systemic reactions had developed very frequently, fever and restlessness being the main symptoms. There were a few of moderate severity. In one case the baby had a convulsive seizure on the day following the third inoculation and the mother decided not to complete the course. Altogether thirteen children had not presented themselves for further injections on account of constitutional reactions. Of these, in Dr. Walker's opinion, six had some justification, as they showed more than average discomfort, while in the case of the other seven it was the mother who was disturbed rather than the child. For example, an infant, aged one year, developed gastro-enteritis seven days after the first injection, and the accompanying convulsive seizure was attributed by the mother to the preceding dose of vaccine.

In discussing allergic reactions, Dr. Walker remarked that, since the extensive employment of immunotherapeutic agents in recent years (vaccines, toxoids, antisera, sulphonamides *et cetera*), it had been necessary to face a further group of allergic reactions connected in some way with the antigen-antibody mechanism. Sensitization phenomena had been seen frequently after most of the agents mentioned, but Dr. Walker had not heard of any after pertussis vaccine. Local and systemic reactions had been considered by many observers to be allergic in nature, although the allergic syndrome had not been presented. Dr. Walker then placed on record five cases of the allergic syndrome following injection of pertussis vaccine. The first was that of an infant, fourteen months old, who, one hour after the third weekly injection, became rigid and cyanosed, and started gasping for breath. The baby appeared desperately ill, but responded to the hypodermic injection of adrenaline. Diphtheria anatoxin had not been given with the pertussis vaccine. The second child, aged eleven and a half months, exhibited a similar but somewhat milder reaction after the fifth weekly injection. Diphtheria anatoxin had not been given. The third child, aged twelve and a half months and the daughter of a medical colleague, suffered, as one might have expected, the most serious reaction in the

series; it occurred after the fourth weekly injection. Diphtheria anatoxin had been given at the same time. Dr. Walker quoted from the doctor's report:

About three hours after the injection she became very quiet and developed a pallid cyanosis; her temperature rose to 103° F., respirations 55 per minute, pulse uncountable. This condition slowly passed off (adrenaline m i was given rather late in the crisis) and she began to play and seemed more normal about two hours later. In the evening about ten hours after the injection her temperature was again 101° F. and she was twitching a little. Next day she appeared more normal and the condition did not recur.

The fourth patient, a boy, aged ten months, suffered his reaction after the fourth monthly injection. The mother reported that his eyes rolled, he screamed and gasped for breath. When examined shortly afterwards he appeared quite normal. No anatoxin had been given. The fifth child, aged sixteen months, developed pallor, cyanosis and marked dyspnoea about two hours after the first injection, but settled down quickly without adrenaline. He had received a concurrent dose of diphtheria anatoxin. It was interesting to note that in the last three cases there was a family history of allergy. Dr. Walker said that he did not consider it wise to administer further injections in such cases of allergy. Apart from a few children who moved out of the district, there were then a total of 17 (or 1.7%) who did not complete the course of inoculations on account of real or imaginary reactions. It was important to keep in mind that a number of the babies were suffering the discomfort of dentition, and many of the symptoms attributed to the vaccine could readily have been explained by the teething process.

Dr. Walker then quoted part of a personal communication of February 11, 1947, from Dr. L. A. McLean, Medical Officer of Health, Brisbane, who conducted a public scheme for pertussis vaccination as follows:

During the year ended 30th June last, 2,297 children between the ages of six months and five years commenced a course of injections. Of these, 92.2% completed the course; 4% failed to appear for the final injection and 3.8% had only one injection. Allowing for a certain inevitable loss brought about by leaving the city, children developing whooping-cough during the course of the injections, as happened in a number of instances, and so, these figures are regarded as satisfactory.

Dr. Walker said that six infants in his series developed a paroxysmal cough soon after the commencement of inoculation. It closely resembled mild pertussis, and it was Dr. Walker's impression that it was associated with the administration of the vaccine. In each case it continued for from one to two weeks. Only two immunized children to Dr. Walker's knowledge had contracted pertussis, one at the age of two years and the other at the age of two and a half years, in each case about one year after inoculation; the complaint was of a mild character. Many children under Dr. Walker's regular care were exposed to other children suffering from severe attacks of whooping-cough. In some cases the exposure was most intimate and prolonged, and yet they proved resistant to the infection.

Dr. Walker then introduced the subject of the "booster dose". As immunity tended to become weaker each year, it had been his custom when an infant was immunized between the ages of seven and nine months to suggest a "booster dose" each year for two or three years. That would strengthen the immunity and help to carry the baby over the danger period. He had given two millilitres of Commonwealth Serum Laboratories vaccine, C strength; up to date a total of 95 children had presented themselves for the reinforcing dose, and no untoward reactions had occurred. Kendrick and Eldering had reported in the *American Journal of Diseases of Children* (October, 1946) that they had recently studied a group of children who had been immunized previously, and had found a rise in the level of opsonic response after the "booster" injection; incidentally they had noticed that a moderately high level of opsonic activity was present even four years after the primary immunization. They had used a reinforcing dose of only five billion organisms.

Dr. Walker summed up by saying that it would seem that the vaccine employed might be fluid or alum-precipitated, and that either might be used in conjunction with diphtheria anatoxin. There were three courses open to the paediatrician to guard the infant against pertussis. The method which currently was most widely followed was to commence inoculation at the age of seven to nine months. Fluid vaccine in a total dose of at least 80 billion organisms or preferably 100 billion or even 120 billion, or alum-



precipitated vaccine in a total of 45 billion organisms, would appear equally effective. There was increasing evidence that the longer interval of four weeks between injections was desirable. The subcutaneous was preferable to the intramuscular route. In view of the extreme danger to infants from whooping-cough during the first six months of life, and of the fact that they were able to develop immunity from pertussis vaccine, serious consideration had to be given to the advisability of commencing immunization at a much earlier period of life than was currently advocated. It had been shown (*The Journal of Pediatrics*, October, 1946, page 490) that local and systemic reactions were negligible and much less severe than those suffered by the older infants even after a total dosage of 100 billion organisms. A "booster" dose could then be administered at the age of seven or eight months as a precautionary measure, although most infants who had been tested still showed a strong immunity at that age. The objection to active immunization at an early age was the time required for immunity to develop. Sauer was of the opinion that it took three months, but Lapin and others, judging by complement fixation tests, were satisfied that it was much less. The ideal, if practicable, appeared to be the protection of the newborn through the active immunization of the prospective mother, and then the offering to the infant of a course of pertussis vaccine at the age of six or seven months. It seemed to be definitely established that protection against pertussis by immunization was a worthwhile procedure in infant care, in spite of the fact that absolute protection could not be guaranteed, and that occasionally severe reactions might be expected. Children with a previous history of whooping-cough would in most cases be safe from a further attack; some who had suffered a subclinical infection and others merely through exposure also would be unlikely to contract pertussis. A small number of infants might rely on a limited period of immunity on account of placental transmission of antibodies from a mother who had suffered from pertussis. The great majority of infants, however, were wide open to the disease. Unfortunately whooping-cough was not notifiable in Australia, and on that account it was difficult to compile statistics as to the efficacy of immunization. Dr. Walker concluded by saying that it had been found possible in Queensland to conduct a public scheme of prophylaxis, and they should not be deterred in New South Wales from inaugurating a similar immunizing programme to protect infant life from such a scourge as whooping-cough with its high morbidity and mortality.

Dr. L. H. HUGHES congratulated Dr. Walker on the excellent results obtained in so many cases. Dr. Hughes said that he was not in a position to discuss the paper from the point of view of personal experience, but he was interested to hear that Dr. Walker had had so few alarming results with larger doses than they had used in the past. Dr. Hughes could recall the days when he had a fair amount of that work, but sometimes had quite alarming results; even the moderately large doses gave alarming results. He reported that, so far as the campaign for immunization against pertussis was concerned, the Royal Alexandra Hospital for Children had approached the Department of Public Health, hoping for help; but they had been rather discouraged by the department, as the latter said that it could not be proved that sufficient immunity was given as a whole.

Dr. R. A. GREEN said that he supported what Dr. Hughes had said, and that Dr. Walker was to be very much congratulated on his extraordinary amount of recording work. They had been alarmed some time previously at the number of young babies dying in hospital from pertussis. They had approached the Department of Public Health and proposed an immunizing campaign. The department had turned down the proposal on two grounds: firstly, that not more than 75% immunity could be promised, and secondly, that the reactions that would probably occur would stop immunization generally and might interfere with the diphtheria campaign. It was no use Dr. Walker's reading his paper unless something was done. What Dr. Walker promised was possible. His results should be sent to the Director-General of Health as coming from that group (the Paediatric Section); that procedure might help. They were certainly lagging behind, and there was no reason why they should not push on.

Dr. C. WARBURTON made one remark about local reactions. He said that in the little experience he had had, he had used a combined diphtheria toxoid pertussis vaccine made by Parke, Davis and Company (45,000 units per millilitre in strength). With regard to the instructions which were given in the pamphlet—namely, that one should give the injection distally into the arm—he had wondered about it; how it could be done with a screaming child? He con-

sidered that it would be very inconvenient, and so had tried the other way, injecting upward, and had found that method bad, producing many more local reactions than with the Commonwealth type of vaccine. It was then that he considered the other type of injection (in the downward direction), as it was said that the fluid ran back into the track produced by the needle and caused local reaction. Dr. Warburton was not able to say how many cases he had had, but he did notice towards the end that, by applying cotton wool immediately over the site of the needle and putting pressure in a downward direction, he was apparently getting fewer reactions.

Dr. EDGAR STEPHEN said that he would be interested to know what doses appeared to have proved effective to the other members present. He had used much smaller doses than those recommended by Dr. Walker, and these smaller doses appeared to have secured immunity or comparative immunity for the patients for whom he had used the vaccine. The doses used had been 2,500 million, 5,000 million and two doses of 10,000 million organisms at weekly intervals. His claim for comparative immunity was based on his personal observation of a young relative, who had been playing with a child who was developing frank whooping-cough. The young relative whooped definitely and vomited once only. Apart from a few coughs in the next few days (unaccompanied by a whoop), there was no further demonstration of the disease. Dr. Stephen had heard of several similar cases with similar doses. As the immunity was not entirely achieved, he felt disposed to advance the doses, but not to quite so liberal a level as the American practitioners of whom Dr. Walker had spoken. He would like to see an intermediate scale of dosage applied to a group of children and the results published. He made a practice of administering a dose of 10,000 million organisms in twelve months.

Dr. D. REYS observed that Dr. Walker's paper gave some useful information regarding the use of Commonwealth Serum Laboratories pertussis vaccine. There seemed to be some difficulty in correlating the results obtained by the use of vaccines prepared in different countries, and there appeared to be two opposing schools of thought. The Americans seemed to favour pertussis immunization, particularly since the investigations made by Sauer, while the British appeared at the moment to be rather in doubt about it—a doubt which had been strengthened by a recent survey. Such lack of correlation did not appear to depend on different routes used in the immunization; there was more to it than that. Dr. Rey understood that the British investigators were at the time making further surveys, using American products—the Sauer and the Kendrick vaccine—and that there was an intention to compare the results so obtained with the results of immunization with British products. He said that that brought him to Dr. Green's comment. It seemed hardly an opportune time to make application to the authorities concerning a procedure the value of which remained in dispute. Dr. Rey thought that any further activity towards extending pertussis immunization, and any endeavour to make it a more comprehensive scheme than that being used by the individual practitioner at the moment, might be better left until there was greater clarity on the question.

Dr. Walker, in reply, said that a few points had been raised. The first was about the "Diph-Pertussis" of Parke, Davis and Company. He had not much to say, as he had not enough cases to give an opinion. In the few he had had no less local reaction was produced than by the Commonwealth Serum Laboratories product. He had tried the needle proximally and distally. He had a nurse standing by, and immediately after the injection a swab of cotton wool was held over the site of the puncture till he applied a piece of adhesive tape in the hope that the pressure would prevent leakage into the needle track. In case there was a bleeding point, as occasionally happened, the adhesive obscured it and there was less agitation on the part of the mother. Secondly, Dr. Walker referred to dosage. Lapin's figures showed that the attack rate among those receiving 80 billion organisms was far higher than among those receiving 120 billion. With alum-precipitated vaccine, of course, the protective dose appeared to be much less. Dr. Walker said that, thirdly, as far as the infectivity was concerned, and the suggested government programme, inoculation was not 100% effective; but it was only necessary to see a few infants at two months of age with whooping-cough to make one want to do something about it. Dr. Walker concluded with the statement that some of his colleagues confirmed what he said—that most of the inoculated children had played with others with whooping-cough and seemed to escape infection, so that that evidence was worth considering.

(To be continued.)



## Post-Graduate Work.

### THE UNIVERSITY OF QUEENSLAND POST-GRADUATE MEDICAL EDUCATION COMMITTEE.

#### FORTHCOMING LECTURES AND COURSES.

The Queensland Post-Graduate Committee announces the following courses and lectures.

##### Anatomy.

Professor H. J. Wilkinson, Professor of Anatomy, University of Queensland, will conduct weekly classes in gross anatomy and neuroanatomy, commencing in mid-September. Facilities for dissection will be available. The course will be suitable for general revision, but particularly for candidates for higher qualifications in surgery. The fee will be £7 7s. per term of ten lectures and will be held at the Medical School, Herston Road, Brisbane.

##### Physiology.

Dr. A. V. Sellwood, Department of Physiology, University of Queensland, will conduct a course in physiology suitable for candidates for higher qualifications in medicine or surgery. The course will commence on Wednesday, September 3, at 7 o'clock p.m., at the Physiology Department, William Street, Brisbane, and will be held weekly. The fee for the course will be £7 7s. per term of ten lectures.

##### Pathology and Bacteriology.

Short courses will be arranged in pathology and bacteriology towards the end of the year if sufficient inquiries for such classes are received.

##### Overseas Lecturers.

Dr. Chandler Brooks, Professor of Physiology at the Johns Hopkins Hospital, will deliver three lectures as follows at the Medical School, Herston Road, Brisbane, at 8 o'clock p.m. on September 15 ("The Control of Water Balance"), September 17 ("The Control of Reproductive Function") and September 19 ("The Control of Temperature"). No fee will be charged for attendance.

Professor R. W. Gerard, Professor of Physiology at the University of Chicago, will visit Brisbane in October and will deliver two lectures at the Medical School, Herston Road, at 8 o'clock p.m., as follows: October 23: "The Mechanism of Actions of Nerves." October 30: "The Present Notions of Synaptic Action." Dr. Gerard has been invited to Australia by the Australian National University, Canberra.

##### Lectures at Country Centres.

The following lectures will be given at country centres.

**Nambour.**—September 6: "Gynaecological Disorders", Dr. H. S. McLelland. October 4: "Treatment of Acute Cholecystitis", Dr. Alan E. Lee. November 1: "Arthritis", Dr. D. A. A. Davis.

**Ipswich.**—September 18: "Orthopaedic Problems", Dr. J. R. S. Lahz.

**Toowoomba.**—September 20: "Allergic States in Childhood", Dr. A. Paterson. October 25: Surgical subject, Dr. D. Yeates. November 22: Obstetrical subject, Dr. M. J. Eakin.

**South Burnett (at Wondai).**—September 20: "Recent Advances in Diseases in Children", Dr. D. C. Jackson.

### THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

#### Annual General Course.

The Post-Graduate Committee in Medicine in the University of Sydney announces that Dr. Chandler Brooks, Associate Professor of Physiology at the Johns Hopkins Hospital, Baltimore, United States of America, will be visiting this country at the invitation of the Combined Post-Graduate Committees of Australia to give a lecture tour of all States of the Commonwealth from September to October, 1947.

Dr. Brooks will give the following three lectures in Sydney: Monday, September 22, at 8 o'clock p.m.: "The Control of Reproductive Function." Wednesday, September 24, at 4.30 o'clock p.m.: "Obesity." Friday, September 26, at 8 o'clock p.m.: "The Control of Water Balance."

All these lectures, which are open to medical practitioners, will be held in the Stawell Hall, 145, Macquarie Street, Sydney, at the times indicated, and are included in the annual general course conducted by the Post-Graduate Committee in Medicine, the yearly subscription to which is £1 1s.

#### Week-End Course at Wollongong.

The Post-Graduate Committee in Medicine, in conjunction with the Clinical Society of the South-Eastern Medical Association, will hold a week-end course on Saturday, September 20, and Sunday, September 21, 1947, at the Wollongong District Hospital, except the film showing, which will be at the residence of Dr. R. T. Suttor.

**Saturday, September 20.**—2.30 o'clock p.m.: "Recent Advances in Medicine", Dr. Richmond Jeremy. 4 o'clock p.m.: "Obstetric Problems", Dr. K. A. McGarrity. 8 o'clock p.m.: Informal showing of medical films and discussion.

**Sunday, September 21.**—10 o'clock a.m.: "Urology in General Practice", Dr. A. C. Telfer. 11.30 o'clock a.m.: "Sex Endocrines", Dr. K. A. McGarrity. 2.30 o'clock p.m.: "Heart Disease in Pregnancy", Dr. Richmond Jeremy. 4 o'clock p.m.: "Eye Injuries" (with cases), Dr. John Maude.

The fee for the course will be £1 1s. There will be no charge for members of the defence forces. Those wishing to attend are requested to notify Dr. Rawdon T. Suttor, Honorary Secretary, Clinical Society of the South-Eastern Medical Association, 60, Kembla Street, Wollongong, as soon as possible.

### MELBOURNE PERMANENT POST-GRADUATE COMMITTEE.

#### PROGRAMME FOR OCTOBER, 1947.

The Melbourne Permanent Post-Graduate Committee announces the following programme for October, 1947.

Professor R. W. Gerard, Ph.D., M.D., of the University of Chicago, will lecture on Friday, October 3 and 10, at 8 o'clock p.m., in the College of Surgeons lecture theatre on "The Mechanism of Action of Nerves" and "The Present Notions of Synaptic Action". Professor Gerard's lecture tour has been arranged by the Australian National University, Canberra. There will be no charge for attendance. The change in date of these lectures should be noted.

Associate Professor Chandler Brooks, Ph.D., of Johns Hopkins University, will give three lectures in the College of Surgeons lecture theatre at 8 p.m. on Monday, October 20, Wednesday, October 22, and Friday, October 24, on "The Control of Body Water Balance", "The Control of Sex and Reproductive Functions" and "The Hypothalamus and Obesity". The fee for this course is £1 1s. Those who have already enrolled for other courses conducted by the committee during 1947 will be exempt from this fee, but are asked to notify the committee if they wish to attend the course.

**Gynaecology and Obstetrics Refresher Course.**—From October 6 to 17 a general practitioners' course will be held at the Women's Hospital, Carlton. This will consist of daily ward rounds conducted in groups, where the routine work of the hospital will be demonstrated and taught. In addition there will be the following lecture demonstrations:

Monday, October 6, at 10 a.m., by Dr. H. F. Bettinger on "Pathology".

Tuesday, October 7, at 2 p.m., by Dr. Kate Campbell on "Children".

Wednesday, October 8, at 10 a.m., by Dr. W. I. Hayes on "Toxemias".

Thursday, October 9, at 2 p.m., by Dr. J. W. Johnstone on "Sterility".

Friday, October 10, at 9.30 a.m., by Dr. W. Lemmon on "APH and PPH".

Monday, October 13, at 10 a.m., by Dr. H. Butler on "Bacteriology".

Tuesday, October 14, at 10 a.m., by Dr. H. W. Bettinger on "Pathology".

Wednesday, October 15, at 10 a.m., by Dr. A. Hill on "Sepsis".

Thursday, October 16, at 4 p.m., by Dr. W. G. Cuscaden on "Cancer".

Residence at the hospital is available for this course and is advised. The fees are £10 10s. for tuition and £2 10s. per week for residence. The class will be limited to 20.

Country Courses.

Horsham.—On October 11 and 12 a week-end refresher course will be conducted at the Horsham Hospital:

Saturday, 2.30 p.m.: Dr. L. Hurley on "Medical Emergencies", to be followed by Mr. J. Turner on "Anal Surgery".

Sunday, 10 a.m.: Mr. A. Hill on "Toxæmias of Pregnancy". 2 p.m.: Dr. J. W. Grieve on "The Non-Thriving Infant".

The fee for this course is £2 2s., or 10s. 6d. per demonstration, and enrolments should be made with Dr. B. Hutton Jones, Lister House, Horsham 577. Medical officers from other subdivisions are also invited. Dr. C. H. Dickson, Medical Secretary of the Victorian Branch of the British Medical Association, will be present at the meeting to inform members of recent medico-political developments.

Geelong.—On Wednesday, October 8, at 8.30 p.m., Dr. A. Anderson will give a demonstration at the Geelong Hospital on "Eye Conditions in General Practice". Dr. D. A. Kidd, "Omagh", 216, High Street, Belmont, Geelong 2857, will make enrolments.

Courses for Higher Degrees and Diplomas.

M.D. Part II and M.R.A.C.P. demonstrations will be given from 2 o'clock p.m. on the following Thursdays:

October 2: Dr. K. D. Fairley on "The Spleen in Relation to Anæmia".

October 9 and 16: Dr. L. Hurley on "Jaundice".

October 30 (2 to 5 p.m.): Dr. T. Maxwell on "Thyroid Disorders".

Enrolments should be made with the Secretary of the Committee, College of Surgeons, Spring Street, C.1, JM 1547, at least two weeks before the commencement of a course.

Correspondence.

THE TREATMENT OF EPILEPSY.

SIR: In the issue of THE MEDICAL JOURNAL OF AUSTRALIA of August 23 Dr. Isabel Williams, of Hobart, draws your attention to the fact that "Tridione" has been in use there since February, 1947, and reports that "the results so far appear distinctly promising". I can join with her in this statement—I have had both clinical and electroencephalographic evidence of *petit mal* response to "Tridione", but I also have had evidence of its toxic properties.

In one case in which "Tridione" had been prescribed since December, 1946, with marked clinical improvement a blood count done in February (when the first news of the effect of "Tridione" on the white cells was made available) revealed a disturbingly low granulocyte count. "Tridione" was therefore reduced from 0.3 gramme thrice to 0.3 gramme once daily. The cell count remained low, and finally "Tridione" was discontinued and there was a return to normality. Another attempt was made to administer "Tridione", but again the granulocytes fell to a dangerously low level, only to rise again when it was discontinued. As this patient had had a promising clinical improvement and was most anxious to try it once more, "Tridione" was again commenced cautiously—0.3 gramme daily. Then as the cell count was stable it was increased again to 0.3 gramme three times daily, and a cell count one week later showed a further fall, but not to a dangerous level. It was therefore decided to continue, but the patient complained of gastric irritation, a skin rash, a sore throat, very severe glare, and this time no reduction in the frequency of her *petit mal* seizures. "Tridione" was consequently abandoned. Neither the patient nor I wished to continue with it.

This is not an isolated case. A colleague has mentioned to me two other cases—one in which a man collapsed at his work with extreme general muscular weakness and another in which the disturbance of vision was so severe that it resulted in a car accident. This patient reported that he felt "absolutely awful, couldn't do a thing" while he was taking "Tridione".

The number of cases treated is small, but here already are three of which I have knowledge in which disturbing toxic reactions appeared on administering "Tridione" and disappeared when it was withdrawn.

Notwithstanding claims to its efficacy in other varieties of epilepsy, I feel that one should be guided by Lennox, who regards "Tridione" as a specific for the *petit mal* triad characterized by the wave and spike disturbance in the electroencephalogram, and restrict its use to such patients if they are accessible, intelligent and cooperative.

It seems strange that though all authorities are agreed that in "Tridione" therapy regular blood counts are a necessity, with particular attention to the granular white cells, the manufacturers should freely advertise "Tridione" in THE MEDICAL JOURNAL OF AUSTRALIA without mentioning this. It is, however, true that the fullest information is supplied on request, yet I feel that in its present form the reassuring tone of the advertisement might tempt the unsuspecting into prescribing "Tridione" as one would a routine anti-convulsant like phenobarbitone. The risk is probably not great, but it does exist.

In conclusion, I would be interested to hear if others have observed many unpleasant side reactions in patients under their care who are receiving "Tridione".

Yours, etc., GEOFFREY TRAHAI.

Royal Prince Alfred Hospital,  
Camperdown,  
New South Wales.  
August 31, 1947.

Australian Medical Board Proceedings.

TASMANIA.

THE undermentioned have been registered, pursuant to the provisions of the Medical Act, 1918, of Tasmania, as duly qualified medical practitioners:

Palfreyman, Colin Russell, M.B., B.S., 1930 (Univ. Melbourne), D.O.M.S., 1937 (London), F.R.C.S., 1940 (Edinburgh), Hobart.

Ferris, Richard Dyason, M.B., B.S., 1936 (Univ. Melbourne), F.R.C.S., 1941 (Edinburgh), Hobart.

VICTORIA.

THE following is a summary of the proceedings of the meeting of the Medical Board of Victoria held on August 11, 1947.

1. *Registrations*.—The following persons appeared before the Board, produced the necessary documentary evidence and were duly registered: David Hall Harris, M.B., B.S. (Adelaide), 1942; Thomas Norman Chenoweth, M.B., B.S. (Queensland), 1944.

2. *Polish Reciprocity*.—The Crown Solicitor advised the Board that graduates of the Polish School of Medicine at the Edinburgh University were not eligible for registration in Victoria within the meaning of the Medical Act, 1928.

The Board accepted the opinion of the Crown Solicitor, and as no reciprocal agreement exists between Poland and Victoria, rejected an application by a graduate of the Polish School at the Edinburgh University.

3. *Medical Register*.—The Board resolved that all persons at present on the Register be circularized by registered letter in accordance with Section 9 of the Medical Act, 1928, but if no reply was received within six months of the date of postage of the registered letter, the name of the person concerned may be erased from the Register.

4. The Board approved of the dissolution of the following partnerships: (a) Partnership agreement between Dr. H. W. F. Mitchell, Dr. A. H. McGregor and Dr. C. F. Mitchell. (b) Dr. J. H. D'Amer-Drew and Dr. J. W. Johnstone.

5. The Board approved of the following partnership agreements: (a) Partnership between Dr. H. Friedman, Dr. S. J. Whiteside and Dr. B. M. Botterill. (b) Dr. J. H. D'Amer-Drew, Dr. D. N. Hewson and Dr. A. J. Whitehead.

WESTERN AUSTRALIA.

THE undermentioned have been registered, pursuant to the provisions of the Medical Act, 1922-1945, of Western Australia, as duly qualified medical practitioners:

Egan, Eugene, M.B., B.Ch., 1926 (Nat. Univ. of Ireland), D.P.H. (London).

Woolcott, John Foster, M.B., Ch.B., 1941 (Univ. Aberdeen), Subiaco.

Watson, Robert David, M.B., B.S., 1944 (Univ. Melbourne), Repatriation General Hospital, Perth.

Cullen, Kevin John, M.B., B.S., 1946 (Univ. Melbourne), Busselton.

- Bellemore, Kenneth Laurence, M.B., B.S., 1947 (Univ. Sydney), Perth Hospital, Perth.  
 Muston, William Barnes, M.B., B.S., 1947 (Univ. Sydney), Perth Hospital, Perth.  
 Prentice, David Hugh, M.B., B.S., 1947 (Univ. Sydney), Perth Hospital, Perth.  
 Moore, Harry James, M.B., B.S., 1947 (Univ. Sydney), Perth Hospital, Perth.  
 Rowe, Harold John, M.B., B.S., 1940 (Univ. Melbourne), Repatriation General Hospital, Perth.  
 Bertinshaw, Leonard Dolan, M.B., B.S., 1942 (Univ. Sydney), Fremantle Hospital, Fremantle.  
 Mitra, Mrityunjay Narayan, L.R.C.P., L.R.C.S., L.R.F.P.S., 1937 (Univ. Glasgow).

## Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

- Coombes, Rollin Vernon, provisional registration, 1947 (Univ. Sydney), Sydney Hospital, Macquarie Street, Sydney.  
 McDowell, Moira Agnes, M.B., 1945 (Univ. Sydney), Lucky Corner, Coonamble.  
 De Monchaux, Robert Joseph, M.B., B.S., 1946 (Univ. Sydney), 7, Almore Street, Mosman.  
 McDonnell, Laurence Edward, M.B., B.S., 1944 (Univ. Sydney), 13, Gilbert Park, Manly.  
 Henniker, Reginald Noel, M.B., B.S., 1943 (Univ. Sydney), 4, Jamieson Parade, Collaroy.  
 Sabiel, Verleen Mary, provisional registration, 1947 (Univ. Sydney), District Hospital, Goulburn.  
 Smith, Alexander Hylton, provisional registration, 1947 (Univ. Sydney), Maitland Hospital, West Maitland.  
 Newton, John Hilton, M.B., 1941 (Univ. Sydney), 125, Great North Road, Five Dock.

The undermentioned has applied for election as a member of the Tasmanian Branch of the British Medical Association:  
 Churton, David Philip, M.B., B.S., 1941 (Univ. Melbourne), 6, Ashby Street, Launceston.

## Obituary.

NORMAN JOSEPH O'CONNOR.

WE regret to announce the death of Dr. Norman Joseph O'Connor, which occurred on August 31, 1947, at Melbourne.

## Medical Appointments.

Dr. J. R. Morris has been appointed government medical officer at Wentworth, New South Wales.

Dr. June M. Chard has been appointed resident medical officer for government mental institutions, Adelaide, South Australia.

Dr. Lorna M. Archibald has been appointed medical officer, School Health Services, Department of Health and Home Affairs, in pursuance of the provisions of *The Public Service Acts, 1922 to 1945*, and *The Health Acts, 1937 to 1946*, of Queensland.

Dr. H. C. Murphy has been appointed deputy director of maternal and child welfare, Department of Health and Home Affairs, in pursuance of the provisions of *The Public Service Acts, 1922 to 1945*, of Queensland.

## Books Received.

"Massage and Remedial Exercises in Medical and Surgical Conditions", by Noel M. Tidy; Seventh Edition; 1947. Bristol and London: John Wright and Sons, Limited; Simpkin Marshall (1941), Limited. 8½" x 5½", pp. 488, with many illustrations. Price: 25s.

"Food Inspection Notes: A Handbook for Students", by H. Hill, F.R.San.I., F.S.I.A., A.M.I.S.E., and E. Dodsworth, M.R.San.I., M.S.I.A.; Second Edition; 1947. London: H. K. Lewis and Company, Limited. 6½" x 4", pp. 132. Price: 6s.

"Memoranda on Medical Diseases in Tropical and Sub-tropical Areas", Eighth Edition; 1946. London: His Majesty's Stationery Office. 8½" x 5½", pp. 396, with many illustrations. Price: 7s. 6d.

"Gynecology with a Section on Female Urology", by Lawrence R. Wharton, Ph.D., M.D.; Second Edition; 1947. Philadelphia and London: W. B. Saunders Company, Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 9½" x 6½", pp. 1048, with many illustrations. Price: 70s.

## Diary for the Month.

- SEPT. 15.—Victorian Branch, B.M.A.: Finance Committee.  
 SEPT. 16.—New South Wales Branch, B.M.A.: Medical Politics Committee.  
 SEPT. 17.—Western Australian Branch, B.M.A.: General Meeting.  
 SEPT. 18.—Victorian Branch, B.M.A.: Executive Meeting.  
 SEPT. 18.—New South Wales Branch, B.M.A.: Clinical Meeting.  
 SEPT. 23.—New South Wales Branch, B.M.A.: Ethics Committee.  
 SEPT. 24.—Victorian Branch, B.M.A.: Council Meeting.  
 SEPT. 25.—New South Wales Branch, B.M.A.: Branch Meeting.

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

**New South Wales Branch** (Honorary Secretary, 125, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

**Victorian Branch** (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

**Queensland Branch** (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute; Brisbane City Council (Medical Officer of Health). Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

**South Australian Branch** (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

**Western Australian Branch** (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

## Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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